



# FP10: Seizing the moment

The next EU Framework Programme  
for Research and Innovation

July 2024

# Executive summary

Europe is running out of time to restore its global competitiveness. And this is highly problematic for both Europe's industries and our society.

Industrial competitiveness – via the prosperity and rewarding employment it creates – is the key to Europe's future. It is a precondition for our society to remain functional, free and fair. And, together with scientific leadership, it puts Europe in the position to mitigate and adapt to overarching challenges such as geopolitical transition, climate change, resource scarcity and the consequences of an ageing society. Science provides the needed answers, and an innovative and competitive industry turns them into scalable solutions for society.

"Innovate or be history" is not only the motto of ERT's 2023 Innovation Flagship<sup>1</sup> – it sums up Europe's two options in the 21st century.

More than ever before, industrial competitiveness is based on pushing outwards the frontier of technology in an actionable and scalable manner. In other words, it is built on science and innovation.

And more than ever does success in science and innovation depend on creating the right ecosystems.

Science thrives only where state of the art knowledge, curiosity, purpose and financial means come together. First class universities that attract all four are of strategic importance beyond their role as places of education.

World-leading research and innovation are expensive and depend on much sought-after human and technological capital. They only thrive in an ecosystem where scientific breakthroughs and technological innovation can be financed, executed and brought to maturity. One precondition for this is a globally competitive industry. Another precondition are efficient and publicly supported enablers. This not only applies to Europe – it is a key driver of the economic and technological success of all leading economies, most prominently the US and China.

The next Framework Programme for Research & Innovation (FP10) will succeed Horizon Europe and span for seven years, from 2028 through 2034.

FP10 is of strategic importance for Europe to remain economically strong, globally relevant and politically autonomous. The stakes could not be higher.

FP10 needs to achieve maximum impact with limited means and against the clock. To measure up, it has to be bold, pragmatic and open-minded:

- **Bold:** FP10 financial firepower should be in the order of at least €200 billion. This more than doubles the budget allocated to Horizon Europe – and in a European context it may sound like a very large number. Moreover, EU Member States already finance R&D at national level. And yet European public support for R&D is lagging other 'big spenders' and global competitors: the US and China.

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<sup>1</sup> "Innovation made in Europe" - ERT publication, March 2023. See also the wide selection of Innovation Stories available at <https://ert.eu/innovation>

- Pragmatic: FP10 has to build on – and learn from – the Horizon Europe experience. A complete re-design would mean significant delays, disruption and uncertainty throughout the ecosystem. FP10 should be set up as an upgraded and improved continuation of Horizon Europe's core elements, which have proven their value. For instance, Pillar 1 and the European Research Council have made a decisive contribution to Europe remaining a top-place for science. Rather than being disrupted, it should be made even stronger.
- Open-minded: A lot can be gained by improving and expanding Horizon Europe Pillar 2 and by including dual-use R&D into the scope of FP10. Pillar 2 would greatly benefit from a stakeholder-led Advisory Council, simplified procedures and extension of scope to accompany projects to maturity. Ending the exclusion of dual-use innovation from FP10 would help Europe obtain the very important 'innovation dividend' of synergies between cross-sectoral R&D.

More than any political declarations, the resources which our political leaders will dedicate to FP10 are the strongest possible signal they will send to those who invest into Europe's future. The size of the final FP10 budget will be the litmus test on whether restoring Europe's competitiveness truly is a political priority.

### **Box 1 - Restoring Europe's competitiveness – FP10 is one part of the puzzle**

A strong and efficient FP10 will be crucial for Europe's global competitiveness, but it is only one of several remedies which the new European cycle has to deliver.

Core elements of a turn-around strategy for Europe:

- EU policymakers need to put the business case for innovation at the centre of all legislative initiatives.
- The EU has to become the best place in the world to do business by shifting from 'prescriptive and complex' to 'pragmatic and coherent' regulation and administration. The EU's overarching political goals have to override silo-thinking.
- The next Commission must spearhead an encompassing programme to abolish the remaining barriers to trade within the Single Market. EU industries need a strong home base for sustainable growth and to achieve economies of scale.
- Europe has to seize the opportunities that remain to become a global leader in the digital economy – and which is within reach, provided EU policy incentivises private investment and abstains from imposing unnecessary regulatory obstacles.
- Europe needs to better manage its energy transformation by creating a Single Market for energy and tackling an investment gap in the order of €0.8 trillion by 2030, scaling to €2.5 trillion by 2050<sup>2</sup>.
- Europe needs to rebuild its defence capabilities as matter of urgency.

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**2** ERT Report on Competitiveness of Energy intensive Industries: [https://ert.eu/wp-content/uploads/2024/04/ERT-Competitiveness-of-Europes-energy-intensive-industries\\_March-2024.pdf](https://ert.eu/wp-content/uploads/2024/04/ERT-Competitiveness-of-Europes-energy-intensive-industries_March-2024.pdf)  
ERT Report on Energy Infrastructure: [https://ert.eu/wp-content/uploads/2024/04/ERT-Strengthening-Europes-energy-infrastructure\\_March-2024.pdf](https://ert.eu/wp-content/uploads/2024/04/ERT-Strengthening-Europes-energy-infrastructure_March-2024.pdf)

## FP10 is a high-return investment opportunity in Europe's future

FP10 offers Europe a much-needed opportunity to step up on science and innovation. Europe cannot afford to miss this opportunity for two reasons:

First, the answers to – or at least mediation of – humanity's most pressing challenges can only be found in science and technology. Breakthroughs achieved in Europe can make a global difference because of our democracies' values and broader perspective.

Examples are progress in medicine and healthcare which can help maintain better quality of life for an ageing population and in the face of new diseases while maintaining costs. Innovation also remains key to successfully managing the global shift towards new energy sources and sustainable energy consumption. Across the globe, climate change adaptation is becoming increasingly urgent in cities as well as in rural areas.

In light of this, it is vital that Europe (still) has the scientific and technological competences and vision to become a driver of much needed solutions<sup>3</sup>. This is partially also thanks to Horizon Europe.

By providing an architecture and funding, Horizon Europe has triggered an evolution from national innovation ecosystems that operate in parallel, to a Europe-wide innovation ecosystem, connecting excellence and broadening perspectives across borders. Horizon Europe has built a very solid basis for FP10 to continue delivering scientific breakthrough and innovation made in Europe.

Second, a well-funded and well-designed FP10 will be a game-changer for Europe's declining competitiveness.

Technological change is fast paced, and on a global market, breakthrough innovation, wherever it takes place, has a global impact. Technological leadership is always challenged, and any failure to keep up is punished fast by customers and markets.

Traditionally, Europe's business case is built on leadership in science and technology. And yet, we find ourselves running only centre field in a catch-

up race in several key technologies. For example, connectivity and AI are huge opportunities for society and industry where the task is now to stay on the ball and compensate for chances missed in the past. Europe also needs to decrease its dependence on critical raw materials and other key inputs from other parts of the world. Future-defining technologies are still in their infancy and a fierce race for ownership (and control and leverage) is ongoing amongst competing global actors.

It is neither a secret nor an accident that both the US and China have overtaken Europe across key technologies<sup>4</sup>. To a significant extent, it is the result of governments in both regions taking highly strategic approaches to gain technological leadership. These span across:

- significant direct and indirect funding for research and innovation,
- early-stage detection for critical emerging technologies,
- mobilising participants in the innovation ecosystem,
- harnessing rather than restricting dual use innovation,
- easing the move from concept to commercialisation via enabling regulatory environments and partnerships.

Both the US and China strongly support science and R&D&I as investments into their countries' future prosperity and global standing.

In contrast, in Europe strategic choices tend to underestimate the importance of financial firepower and pragmatic policy to mobilise human capital in order to master and drive forward key technologies.

And, worse, securing technology ownership is not (yet) sufficiently valued as a means to secure global relevance, strategic autonomy and prosperity. In many Member States, such thinking (still) leads to national underspending on domestic science and R&D activities. But as long as 'spending too much' is considered a worse mistake than spending too little, important opportunities are missed. This dynamic also spills over to EU level decisions:

<sup>3</sup> ERT Innovation Flagship: <https://ert.eu/innovation/>

<sup>4</sup> As set out in the 2024 ERT Benchmarking: <https://ert.eu/bmr2024/>

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If Horizon Europe has one dark chapter, it is the experience of how opportunities are lost due to tight national purse strings.

With EU economic growth on a downwards slope, FP10 may be the last occasion for Member States to 'think bigger' when deciding on budget allocation for science and technology. The same applies for national R&D programmes. The right answer is not to merely shift resources from one to the other, but to increase both.

Furthermore, the EU's approach to its defence capabilities – and innovation in this area – also appears to have fallen out of time. A rigid separation between civilian and military R&D is neither wise nor aligned with the world we are now living in. With FP10 Europe needs to find a pragmatic approach to 'dual use' R&D that well reflects that it serves military and civilian industries, and that Europe cannot afford to forego important innovation synergies.

In short, our leaders need to recognise FP10 for what it is: a high-stakes and high-return investment (by EU taxpayers) in Europe's future – and the window of opportunity is closing.

### 1) FP10 high impact areas – an industry perspective

For Europe's citizens' investment in FP10 to generate high tangible returns in the not-too-distant future, the FP10 portfolio needs to be well calibrated.

Without prejudice to other FP10 objectives, a sufficiently large portion of FP10 funding and energy needs to be devoted to projects in high impact areas.

High impact can be reached by 1) programmes that are likely to yield tangible results and trigger positive dynamics which will feed through into greater global competitiveness, independence, prosperity, and employment in Europe in the mid-term.

High impact also means 2) playing the 'long-game' and helping push the technological frontier outwards in more visionary areas where scientific breakthrough could open up new horizons and/or translate into sizable economic activity in the future.

Reflecting the competitive pressure Europe finds itself under in 'future defining' sectors, FP10 programmes would achieve such 'high impact' by supporting Europe's research community and industries in:

- Developing new or improved solutions to follow through in an economically viable way on core commitments, such as climate change reduction.

Examples: CCUS, green energy generation and storage, electrification; production and use of hydrogen (and other green fuels, including those of biogenic origin).

- Strengthening, even defending, a leading position by better leveraging existing strength.

Examples: biotech revolution for both life science and green materials; information and communication networks technology (5G/6G).

- Increasing own capacities / developing alternatives in key sectors to reduce dependence on third countries.

Examples: microelectronics and chipsets; availability of critical raw materials, including recycling.

- Advancing and securing a stake on terrain where 'ownership' of technologies will be key for future competitiveness and security.

Examples: AI and (edge) cloud, digital security technologies.

- Laying the ground for future (extreme performance) infrastructure to enable the application of new technologies for all parts of life, society and industry:

Examples: 6G technology and 'beyond 6G' future networks, and research into supporting hardware and integrated circuits.

- Pioneering and securing a sizable share in new technology fields which, once mature, will lead to system-wide change.

Examples: fusion energy which has the potential to (eventually) revolutionize energy production and secure Europe's leadership in sustainable technologies; quantum computing technology; industrial metaverse.

For a longer – but still not exclusive – list of high impact areas for R&D under FP10, see Annex 1.

The goal setting for FP10 should take a technology-neutral approach. What matters are the outcomes in terms of impact through new discoveries and/or problems solved. Success in both is put at risk if R&D projects are specified in an overly restrictive ways or close off relevant technology pathways.

## 2) Horizon Europe is a success

Overall, Horizon Europe has been a success. It has stimulated and strengthened Europe's research and innovation ecosystems over the innovation cycle (see Annex 2). It has indeed been a high-return investment for Europe's taxpayers – although the invested amount (ca. €95 billion) was much lower than recommended by stakeholders.

### A. Pillar 1

It is universally recognised that Horizon Europe Pillar 1 is a crucial factor behind Europe's excellence in science and breakthrough research. In particular the European Research Council (ERC) is supporting world-leading frontier research and contributes to a leading, vibrant science community. Both provide important impulses for innovation by our industries and stimulate the creation of deep tech start-ups. Europe's scientists and industries also benefit from a wide net of Pillar 1 - supported research infrastructures, which attract and amplify expertise. Without Pillar 1, our scientific and human capital would undoubtedly have fallen behind in global comparison.

From an industry perspective, the Marie-Sklodowska-Curie Actions (MSCAs) stand out as forging much needed relationships and enabling 'cross-fertilisation' between industry R&D and academic research in the context of Pillar 2 Research and Innovation Actions (RIAs) and Innovation Actions (IAs). MSCAs (and RIAs / IAs) trigger industry participation on upstream, academic and exploratory topics of interest, reducing product-IP interference and smoothening collaboration opportunities in a pre-competitive environment.

In mixed academic-industrial consortia, MSCAs enable industrial PhDs, e.g. based at the industrial partner with industrial as well as academic supervision.

In short, MSCAs make a significant contribution to bridging the gap between state-of-the-art science and industrial needs and adoption. Enrico Letta's Report on the Single Market rightly emphasises the role of MSCAs as instrumental in creating a 5<sup>th</sup> Single Market Freedom for Innovation.

### B. Pillar 2

Horizon Europe's Pillar 2 is generating immediate benefits to Europe's industry and competitiveness by triggering innovation activity and creating shared objectives.

First, by providing funding and the opportunity for pre-competitive cross-institutional collaboration, Pillar 2 triggers investments in innovation projects that otherwise would not become reality. It complements funding at national and/or regional level and allows to finance also more expensive projects.

Second, Pillar 2 creates value far beyond the immediate financial impact, because it brings institutions of all types together in joint projects for collaborative advantage and innovation.

Why is this so important? In today's complex and converging technological environment, collaboration and partnership have become the keys to innovation. And within a very diverse ecosystem – academia, research and technology organisations (RTOs), large industry, SMEs and start-ups<sup>5</sup> – well-matched actors may not always find each other on their own.

Horizon Europe projects create significant value by bringing stakeholders and specialists together in dedicated R&D&I platforms (including the up-and-running and newly planned FP Public Private Partnerships (PPPs) and Joint Undertakings (JUs) as well as Important Projects of Common Economic Interest (IPCEIs) for pre-competitive cooperation.

Horizon Europe projects lead to the build-up of know-how across sectors and across borders, where stakeholders acquire new ideas and follow state of the art science and technology. Projects are also a way to achieve synergies and critical mass and build on early proof of concept. Collaboration also helps identify and attract skilled people and talents internationally.

Specifically, PPPs are a crucial tool to promote strong innovation ecosystems as they offer industry partners a well-established structure for peer-to-peer cooperation between skilled researchers from all over Europe, allowing them to establish networks of talented people, exchange new ideas for state-of-the-art research and apply them in addressing societal and industrial challenges, and deliver breakthrough demonstrators. PPPs have attracted commitments by industry in financial terms and

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**5** A description of industry's interactions within the innovation ecosystem,

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– much more importantly – very considerable commitments “in kind” (i.e. human capital, sharing of facilities etc).

**C. Pillar 3**

Although not primarily directed at large industry, Pillar 3 is much appreciated because it stimulates Europe's innovation ecosystem and helps compensate for one of Europe's weakest spots: a lack of funding for start-ups and scale-ups.

Pillar 3 supports deep tech start-ups via targeted financing, allowing them to scale up and thrive in Europe, rather than facing the choice to ‘leave Europe or whither’.

Given that Europe's risk capital and venture capital markets are still strikingly ‘under-size’ compared to our deep-tech innovation potential, Pillar 3 has been a very important first step and has delivered proof-of-concept.

A well calibrated FP10 should build on and enhance these very important contributions. Targeted adjustments would amplify its impact further.

Of course, even a very well-funded FP10 will not deliver the EU from its underlying challenge to grow a liquid and scalable venture capital sector that channels private sector investment into EU-based start-ups.

**3) FP10 as an upgrade of Horizon Europe**

FP10 is a timely and vital opportunity to build on the many successes of Horizon Europe – and at the same time correct weaknesses that have held back Horizon Europe from living up to its full potential.

The alternative would be a structural overhaul of the ‘Three Pillars’ structure, but this does not have any obvious upsides:

Splitting FP10 into separate programmes would lead to a loss of coherence and synergies.

At the other extreme, merging FP10 with other EU funding programs would result in a loss of focus and, most likely, a lower budget for R&I.

There are also many practical downsides to breaking with the existing Three-Pillars structure.

Restructuring would put programmes on hold and cost time (which Europe's innovation ecosystem simply does not have). Programme partners across research, industry, SMEs and start-ups would struggle with resulting disruptions. And as R&D time horizons are long, lack of predictability would discourage future participation. And lastly, a significant overhaul would distract from correcting weaknesses that are truly problematic and can be addressed effectively already under the current set-up.

**To be a real upgrade of Horizon Europe, FP10 should build-on and enhance the three Pillars****A) More financial firepower: EUR 200 bn**

Horizon Europe's success is not only about funding, but funding is both a very important enabler and a strong incentive.

Multi-year commitments such as research & innovation projects need predictable funding because the innovation “fabric” that is currently being woven (thanks to Horizon Europe) is nevertheless fragile and needs robust long-term perspectives.

Europe's research and innovation community rightly names €200 billion as the ball-park figure for a sufficient FP10 budget<sup>6</sup>. It does so for two reasons:

First, to help address existing finance bottlenecks in the three Pillars and to launch more projects<sup>7</sup>, and actions to achieve even greater impact for Europe's innovation leadership and competitiveness.

In fact, on average Horizon Europe application success rates are low when considering the effort invested and comparing it with other regional and/or national funding instruments. This discourages even high-potential applicants and important opportunities are likely foregone. This can only be remedied by a significant budget increase.

<sup>6</sup> See also the ResearchMatters campaign: <https://research-matters.eu/>

<sup>7</sup> As well as to extend funding to projects that had been awarded a Seal of Excellence but were not funded due to budget constraints.

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Second, to increase its scope, firstly within Pillar 2 to allow it to complete its mission (see point C below) but also to broaden application to dual-use projects.

The call for €200 billion is more than just about a monetary commitment. It is a challenge to Member States to prove that they take up the fight for Europe's competitiveness in a very difficult global setting and stand in Europe's tradition to find science-based and technological solutions for humankind's most pressing problems.

The €200 billion budget should be accompanied by a strong commitment that, apart from preserving an ability to react flexibly to global crisis situations or breakthroughs in game-changing technologies, overall 'FP10 policy' will be stable and predictable over the long term.

One more qualification is needed: devoting sufficient budget to FP10 does not in the least absolve governments from stepping up national R&D programmes, and it certainly should not be used as a justification to shrink budgets for national R&D support.

For FP10 and national programmes alike, the opportunity cost of underspending on R&D and innovation will be massive also for next generations of Europeans. Paraphrasing Derek Bok: "If you think R&D is expensive, try ignorance."<sup>8</sup>

## B) Pillar 1

Frameworks like the Marie Skłodowska-Curie Actions (MSCAs) are one of the reasons why Europe still succeeds in pushing the frontiers of science and technology outwards. This is only possible if academia, research institutions and industry work together in trustful and dynamic relationships – which comes down to bringing the right people together for a shared purpose and with clear rules for engagement. Such cooperation is of course a 'win' for industry, but it is also an important experience and opportunity for academic researchers who benefit from working in a team with world-leading industry specialists and their state-of-the-art technologies, facilities and data.

Unfortunately, under Horizon Europe budget limitations mean that too many applications for MSCAs are not successful. Very low success rates imply much too many missed opportunities. Moreover, the low probability of success discourages

many applicants from trying in the first place. Even worse, systemically low chances for success lead to frustration and make Europe a less attractive place to study and pursue academic careers when compared to more lavishly funding (and competing) world regions.

FP10 is the opportunity to significantly increase the budget foreseen for the MSCA and other frameworks.

Increased funding would stimulate even more, and more fruitful, cooperation between academia, research institutions and industry (and programmes could also be more open to other parts of the innovation ecosystem (e.g. technology infrastructures)). And, just as significantly, it would be an important signal that Europe's leaders are serious about securing the excellence of Europe's universities and providing researchers with better perspectives for satisfying careers in Europe rather than elsewhere.

## C) Pillar 2

Industry has most interaction with Pillar 2 and, as a result, also strong views on how it could be upgraded to live up to its full potential.

The future share of Pillar 2 in the overall FP10 funding should duly reflect its widened scope (proposed below). It also should be commensurate to its overall importance to help deliver innovation results that contribute directly to Europe's industrial competitiveness in a very challenging global setting and in a fast-changing technology landscape.

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### Staying on the right track

The first recommendation is a confirmation:

One of the reasons why the Pillar 2 Public Private Partnerships (PPPs) and Joint Undertakings (JUs) obtain tangible results, is that they do not impose any 'financial self-sufficiency requirement'. Industry participation is high because industry can contribute to projects largely 'in kind', rather than in cash.

On the other hand, replacing the role of in-kind contributions by demanding financial contributions or adopting a 'financial self-sufficiency' approach would be counterproductive.

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<sup>8</sup> Derek Bok, President of Harvard 2006 – 2007: "If you think education is expensive, try ignorance"

First, it is incompatible with genuine peer-to-peer collaboration between industrial and academic researchers, which underpins the success of ground-breaking PPP projects that generate real impact for society. Second, instead of leveraging private investment, requiring private contributions to be largely or even entirely in cash would drive out industry participation and reduce opportunities to scale innovations.

In other words, modelling Pillar 2 PPPs and JUs on the European Institute for Innovation and Technology (EIT) Knowledge and Innovation Communities (KICs), – i.e. expecting industry participants to make PPPs financially self-sufficient – would make these instruments much less effective.

### Preserving & improving key instruments

Public Private Partnership (PPP) instruments / Joint Undertakings (JU) have proven their value – if anything, there should be more of them under FP10.

That said, it would be beneficial to consult industry more on work programmes. And to stay abreast of market and technology developments, inputs from the whole value chain should be taken into account in a better way. This can be achieved via an improved balance of represented relevant actors.

FP10 should also continue regular collaborative RIAs and IAs projects – i.e. the targeted cooperations between universities, knowledge institutes and industry – as part of the different Pillar2 clusters.

The division of clusters also has worked well and should be maintained.

### Removing roadblocks and improving efficiency

Apart from funding, the biggest roadblocks within Pillar 2 are the administrative burden and uncertainty imposed on those wishing to participate in projects. Companies, including start-ups and SMEs, point out that administrative aspects have become significantly more complex than they were under Horizon 2020.

The move to FP10 should be accompanied by a simplification of administrative procedures

to overcome the current situation where administrative complexity de facto favours incumbent/experienced entities over newcomers. (See Box 2 for more details).

#### Box 2 - Improving the Pillar 2 application processes:

Project calls need to be well-formulated to:

- enable the efficient cooperation between partners (competition, IP issues...)
- avoid scenarios of contradictory orders" / "double knot" (conflicting expectations between maturity / technical expectations and expected deliverables.)

Submissions should become easier to manage, whereas currently:

- the Legal Entity Appointed Representative (LEAR) appointment creates a heavy administrative dossier for submissions
- submission deadlines are very short

Time to start grant process should be brought down to less than three months.

Hurdles during the application process are far from banal. Together with low success rates (due to high competition amongst applicants), they discourage many stakeholders from seriously considering participation in Pillar 2 projects. This applies even to large industry, not to mention SMEs or start-ups.

There is also room for improvement in the administration / handling of accepted projects. The transition to FP10 provides the opportunity to reverse the trend of outsourcing project governance work (the “project officers”) to the Research Executive Agency.

Returning project governance work to the direct responsibility of DG RTD would ensure high levels of sector specific expertise within the Commission. And it would restore flexibility at project level which is only possible if the ‘bigger picture’ is understood by those running the project who then also have the necessary decision power<sup>9</sup>.

<sup>9</sup> Under the current set up flexibility has deteriorated to the point where implementing agencies have become reluctant to allow projects a minimum of flexibility even if this is needed to adapt to changes in policy (vs. following the fixed project’s administrative reporting planning).

In addition, there would then be a functioning feedback loop between those running the project and the policymaking DGs in the European Commission<sup>10</sup>. And it is in the common interest to ensure that future projects draw on learnings and empirical evidence from successful projects: a functioning feedback loop would add significant value beyond the actual project itself.

Last but not least, the track-record of outsourcing has been mixed at best. Implementation agencies' skills and availability of support for project participants vary considerably. Such shortcomings hinder progress and are especially problematic for projects with special features such as cascade funding grants or transnational access.

From an overarching perspective, given the many areas that could benefit from Pillar 2 instruments, resources should not be 'locked in' in projects that do not yield results. From time to time, the performance of individual projects should be evaluated. The transition to FP10 should be used to develop objective evaluation criteria.

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### Making more of Europe's Technology Infrastructures

DG RTD has rightly launched preparatory work for a potential EU policy on Technology Infrastructures. If successful, this policy would contribute to greater industrial competitiveness. For example, it would speed up (even enable new) innovation by improving access to pre-competitive testing and demonstration of new technologies, advanced materials or digital tools (to name just a few). It might even help address transversal challenges that affect all sectors, whether triggered by disruptive technological change or workforce skills as a bottleneck in the adoption of new technologies.

One important factor that decides whether these benefits will materialise is funding. FP10 should ensure that Pillar 2 has sufficient budget to allow for a meaningful implementation of a future EU policy on Technology Infrastructures.

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### Making better use of AI

AI has the potential to massively speed up R&D&I (and therefore time-to-market) in many highly competitive sectors, for example life sciences or advanced materials. In parallel, the supercomputing Ecosystem developed by the EuroHPC JU and related R&I initiatives will play a crucial role for the advancement of AI in Europe.

Researchers across the EU would benefit from shared insights in how to optimise the use of AI for R&D purposes. Thinking should already start now on how to leverage Pillar 2 to disseminate knowledge to industry, SMEs, academia and research institutions.

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### Seeing projects through to maturity

FP10 would be the occasion to finally complete Pillar 2 and correct a grave conceptual error in its design.

Currently Pillar 2 stops 'too early' at Technology Readiness Level (TRL) 7, i.e. at the stage where prototypes reach the demonstration phase<sup>11</sup>. The result is that innovation projects, which Horizon Europe has initially nurtured and enabled during the early-to-mid TRLs, are not supported to maturity and scale-up.

This is counterproductive because opportunities are lost in the very last meters, although they could have created substantial value to Europe's industries: The real impact of Horizon Europe remains below potential also for 'successful' projects, simply because they are not seen through to the end.

Moreover, new technologies developed in Europe (and partially supported by European taxpayer money) might still be brought to market outside Europe in countries where high stage TRL R&D is supported more actively.

Last but not least, if companies anticipate a very difficult scale-up challenge due to a lack of support, this also disincentivises applications for early TRL projects.

Ideally a seamless extension to higher TRL stages should be combined with the use of regulatory

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<sup>10</sup> The practice to put agencies in charge of project implementation has decoupled Commission Services in charge of policy from cutting edge knowledge on new technologies – the result is inadequate policy and programming development.

<sup>11</sup> See Annex 2 for an overview of Horizon Europe Pillars as per Technology Readiness Levels

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sandboxes to allow for disruptive information and regulatory learning to take place at the same time.

Financing thresholds for projects focused on experimentation or proof of concept in sandboxes and for projects focused on technology development should be at the same level.

There are cases where IPCEIs (partially) compensate for premature cut-off. That said, even though the IPCEIs that have seen the light of day are very valuable, there are not many and the granting process has been administration heavy and lengthy. As the IPCEI granting process itself needs urgent improvements – and even if this was accomplished by the launch of FP10 – a pragmatic and integrated solution as part of Pillar 2 would still be extremely important to cover cases where either industry cannot wait for an IPCEI, or where the IPCEI approach simply is not suitable.

Greater continuity beyond FP10 would also be achieved, if the Commission would proactively guide projects that are approaching completion to other relevant EU programmes, for which they could be placed on a waiting list. This status could be validated by a post-execution evaluation of project performance.

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### Sharpening the Missions approach

The approach to launch EU-wide Missions has been innovative, but at least from an industry perspective, their implementation has not met expectations.

The EU has not yet found a ‘winning approach’ to setting up Missions. A key factor is that objectives are not clearly prioritised: i.e. are Missions to serve primarily the purpose of driving innovation? Or are they mainly intended as a sort of ‘community-building approach’ across the EU to mobilise buy-in and participation by local administrations?

Both approaches have value, but in hindsight it was a misjudgement to anchor Missions with a ‘community approach’ in Horizon Europe, even if this may have looked good on paper as a cohesion

exercise. The reason is that such a Mission set-up undermines the delivery on innovation promises, because of a) the complexity of administration and stakeholder management and b) the fact that those who need to deliver innovative technological solutions are not in the driving seat.

There is one exception to this criticism: the Mission to combat cancer and its consequences<sup>12</sup> is indeed well-conceptualised and has secured buy-in from the relevant stakeholders.

Looking at FP10, the Mission concept deserves a second chance. That said, it should be critically assessed which of the existing Missions are best continued as part of FP10 (or alternatively could be transferred to other EU programmes).

Missions that will be continued under FP10 should be adjusted to profit from lessons learned:

First, Mission topics need to become much more concrete and deliverables much more tangible<sup>13</sup> without losing transversality and alignment with community objectives<sup>14</sup>. They need a clear focus of effort, rather than be spread thin over too many stakeholders and parallel objectives.

Second, industry should be an essential – and listened to – part of EU Missions, as it is industry that will generate and implement the innovations needed to achieve a mission.

Third, the Commission itself needs to better align on Mission objectives and pathways ‘to get there’ across all relevant DGs. And it should share the responsibility for making missions successful.

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### Steering by an Advisory Council

For Pillar 2 to truly perform, one element is still lacking: a central body that advises on strategy and implementation.

Pillar 1 and Pillar 3 are very different in nature and purpose, but they both have performed very well. Their achievements are made possible by strong central structures that are tailored to their core

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**12** Full mission description: “Cancer: improving the lives of more than 3 million people by 2030 through prevention, cure and for those affected by cancer including their families to live longer and better”

**13** President Kennedy’s original Moonshot mission was crystal clear: “We choose to go to the moon ... in this decade”.

**14** For example, the construction of sustainable and resilient data storage infrastructures is a vector of technology generation and territorial impact, and combines ICT technologies, sustainability (water, energy), climate resilience.

purpose and that set both a clear strategic course and the highest implementation standards.

For Pillar 1, the (very powerful) European Research Council (ERC) serves as a funding agency and thereby ensures the selection of the best projects and overall strategic coherence. It is largely composed of leading scientists with an in-depth understanding of Europe's academia.

For Pillar 3 the Board of the Innovation Council secures the quality of investment decisions. It brings together experts with strong start-up and deep tech credentials.

In the light of those examples – and the various 'need to improve' areas of Pillar 2 – it is striking that Pillar 2 does not have its own council of experts. In the meanwhile, the stakes are growing in the global race for technological leadership – and Europe needs to ensure that its highest profile R&D support programme performs at full potential at all levels.

FP10 is the best opportunity to strengthen Pillar 2 by installing an 'Industrial Competitiveness Advisory Council'. This body should be composed of strategically versed and highly experienced professionals who understand global technology trends and Europe's most important technology challenges, strengths and opportunities (including across-disciplines). They should also have a deep understanding of corporates, including their R&D functions and value chains. Amongst the most suitable candidates would be EU companies' Chief Technology (or Innovation) Officers. SMEs and start-ups, as well as leading Technology Infrastructures should also be represented. The Council should span sectors and value chains that are relevant for FP10 priorities.

This new Advisory Council should, as a primary role give guidance on strategic objectives reflecting not only the challenges at hand, but also policy developments in various sectors, geopolitics, global markets and shifting technological frontiers. Box 3 sets out areas where an Advisory Council could add value.

Moreover, the Council could advise on modalities for calls for projects and project implementation as well as on how to stimulate greater corporate and start-up participation.

Across the three Pillars, direct discussions between the three Councils would allow for better coordination and more seamless pass-through of insights on challenges and the innovation ecosystem's evolving needs.

### Box 3 - Establishing a Pillar 2 Advisory Council: contributions and value added.

Ensuring relevance:

- Guidance on overall Pillar 2 strategy and key sectors
- Advice on 'up-to-dateness' of project calls and objectives in the light of global technology developments

Strengthening coherence:

- Exchange and coordination with the ERC and the Board of the EIC
- Counterparty for exchange with R&D Flagship projects run by other Commission DGs
- Guidance in the implementation of an EU Policy on Technology Infrastructures

Improving implementation:

- Oversight to ensure an appropriate balance between projects at mid and high TRLs
- Setting KPIs for the administration of Pillar 2 calls for projects
- Evaluation of performance of Pillar 2 projects and advice on improvements (or in the event of non-performance discontinuation of projects)

## D) Pillar 3

### Strengthening the European Innovation Council

The European Innovation Council has proven its value. It reaches start-ups directly and has already helped many to scale up. It also has a very important strategic advantage: technology openness.

Given its clear merits, FP10 should allocate a significantly larger budget to the European Innovation Council.

A larger budget would allow to improve access for industry participation, in addition to SMEs and start-ups. Experience has shown that collaboration between big and small industries – often across areas of specialisation, or even across sectors – has become a vital enabler and driver of innovation. Broadening Pillar 3 support for scale-up also for

those constellations would help promote what is already often the only realistic way to stem innovation projects, including by deep techs. And by improving perspectives, it would be a very efficient and practical way to make the innovation ecosystem even more dynamic.

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### Defining winning recipes for EIT Knowledge and Innovation Communities

Experience with the European Institute for Innovation and Technology (EIT) is less clear cut.

The self-sufficiency approach imposed on the EIT Knowledge and Innovation Communities (KICs) constrains their ability to make full impact. That said some KICs have achieved a rare combination of innovation, support to start-ups and education that seems to be bearing fruit. A thorough analysis, reflecting the KICs various business models, would shed light on if and how their purpose should be made more precise or re-defined.

### E) Dual Use

Europe's security situation has dramatically changed in February 2022 when Russia invaded Ukraine. In the meanwhile, geopolitical tensions are growing with security implications globally as well as for Europe.

The days of the post-Cold War "peace dividend" have come to an end and now, to maintain security and sovereignty, EU Member States will have to (re-)invest massively in their defence capacities (also leveraging EU-wide scale potential via cooperation and coordination). In all such scenarios, future access to essential equipment can only be secured via increased sourcing from Europe-based production and value chains.

Fuelled by global competition, technological transformation in the defence sector is advancing fast, implying that current defence technology will become obsolete and ineffective sooner rather later. And whilst this is a serious security threat, it also is a huge opportunity for Europe because the development of new or improved defence and civilian applications builds on the same underlying technology innovations.

This opportunity is vast because the potential to double-leverage R&D investment exists for a very wide range of industrial sectors. It goes far beyond arms and ammunition manufacturing and aviation. It encompasses space technology, advanced electronics, AI, cyber security, connectivity, energy,

chemicals, advanced materials, construction, nutrition and health.

But for Europe to seize this opportunity it has to stop segregating dual-use innovation. The lost "peace dividend" will need to be replaced with a maximised "innovation dividend" from cooperation and cross-fertilisation across all major industry sectors, including defence. Global competitors have been following this approach for decades, building innovation ecosystems and technological leadership also on this basis.

For FP10 this is a 'make or break moment'. EU decisionmakers have to prepare the way by tearing down the artificial 'fences' that exclude 'dual-use' projects – and correct a major weakness of Horizon Europe. The focus should shift to drawing the line only between innovation for specifically military applications and 'everything else'. This would have the benefit of leaving untouched the existing dual-use definitions that are relevant for other legislations. And in any case, military specific R&D necessitates levels of confidentiality and security that would not be feasible in an FP10 context.

### F) Taking into account the international dimension

When shaping FP10, the international dimension needs greater attention both in terms of opportunities and risks.

First, Europe's innovation ecosystem would benefit more from international cooperation with Horizon Europe associated countries if stakeholders from those countries were put in a better position to understand what they can expect from Horizon Europe. Clear communication and simplified access would help in this respect.

Moreover, cooperation should be extended to other like-minded countries that are relevant for Europe's green and digital transformation and economic security.

Second, it is problematic that a strict focus on the location of a company's headquarters excludes companies with a strong, or even predominant, European footprint from participating. This harms both the company and the European economy.

Third, in several sectors, projects have only been truly successful, once their results are reflected in international standards. The reason is that international standardisation is a key factor for interoperability, scalability and commercial viability of innovation – including, even especially,

for projects supported by Horizon Europe. To follow-through, Europe needs to strengthen the pathway between research and market and strategically defend and expand a strong presence in international and industry-led standardisation bodies. European stakeholders and institutions need to step up as vocal participants in joint global technological advances in order to transform research outcomes into innovation on global markets.

Fourth, on a global market it is essential to make sure that IP and exploitation rights are not limited to the EU territory only. (e.g. by making sublicensing rights to affiliated entities a standard). Digitalisation does not stop at the EU borders – and neither should exploitation rights.

"Open access to R&D results" should be supported, but access to research data has to strictly follow the principle "as open as possible, as closed as necessary". The possibility of exceptions should be continued, taking into consideration the legitimate interests of the beneficiaries including commercial exploitation and any other constraints, such as data protection rules, privacy, confidentiality, trade secrets, EU competitive interests, security rules or intellectual property rights. In an international context that means that a level playing field should be guaranteed, with reciprocity a condition for international collaboration.

## Concluding remarks

FP10 – and national R&D support programmes – have never been as important as now.

As Enrico Letta describes it in his Report on the EU's Single Market<sup>15</sup> the world has become much "larger". And even in this changed context with its various challenges and the 'resurgence of power politics', the "European Union's success rests upon the pillars of free trade and openness".

However, for this to remain true, Europe needs to be on top of today's and tomorrow's key technologies. This vision is entirely realistic because Europe does (still) have 'what it takes' both in terms of ambition, scientific excellence, technological expertise and industrial ecosystems.

What Europe is currently short of is a strategic industrial policy matched with adequate investment in Research, Development and Innovation.

Substantial national R&D support – and at central level a strong FP10 will be high-return investments in Europe's future competitiveness and prosperity. A strong FP10 means both a sufficient – €200 billion – budget for FP10 overall and smart improvements to existing building blocks (notably Horizon Europe Pillar 2).

Enrico Letta rightly calls for the development of a 5th freedom for innovation within the EU Single Market. A well designed and well-funded FP10 is the key to turn this into a 5th freedom with real impact.

In today's word Europe cannot decide on the tide. The more so does it have to make sure to be fit enough to ride the waves.

<sup>15</sup> Much more than a Market <https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf>

## Annex 1

### Examples for high impact focus areas for R&D under FP10

More detailed examples – but by far not an exclusive list:

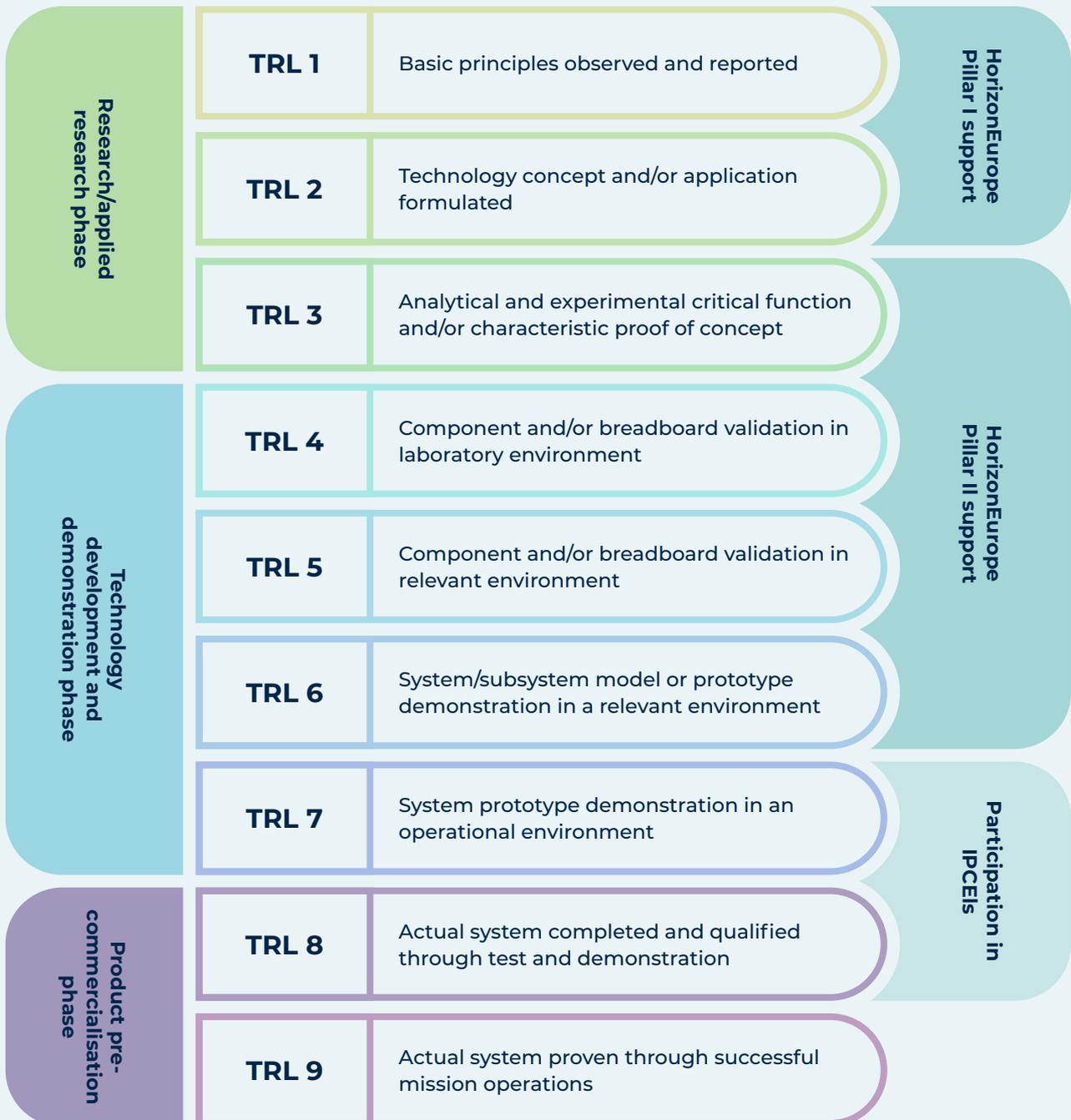
- **Energy and climate change-related technologies** for energy savings, generation and transport:
  - optimisation of green energy generation technology
  - flexible and sustainable energy storage
  - maximising efficiency of intelligent and interconnected grids
  - development and use of advanced materials
  - Hydrogen & EV batteries (efficiency and circularity)
  - energy generation via fusion technologies
- Decarbonisation of industry:
  - electrification of processes
  - Coupling heat and electricity
  - GHG reduction technologies and CO2 storage
  - energy efficiency / loss minimization
- **ICT and Digital technologies** that will revolutionise daily life and industrial production at global level:
  - enhanced (and energy saving & sustainable) connectivity via 5G, 6G and Beyond 6G
  - 6G (and beyond 6G) hardware and integrated components
  - Fixed networks, including optical network and home LAN/WIFI
  - Cloud native networks
  - microelectronics, chipsets
  - energy efficient computing (including servers and their surroundings)
  - industrial internet
  - digital twins

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- AI
  - adoption
  - automation
  - connectivity
  - security
  - Artificial General Intelligence (AGI)
  - Neuromorphic AI
  - Quantum AI
- technology convergence (digital twins)
- technology convergence (e.g. industrial metaverse) and cyber physical continuum (e.g. digital twins)
- high performance computing
- Quantum technology and quantum-resilient cryptography, quantum communication computing
- Robotic and autonomous & connected systems
  - Automated, Connected, and Unmanned Transportation: air, land, surface and underwater
- Health sector
  - bioengineering
  - genomic biomarkers and diagnostics
  - personalised diagnosis and treatments
  - better use of data and
  - new (e.g. digitalised and automated) manufacturing technology
  - health system data standardisation
  - healthcare efficiency, e.g. workflows, utilisation
  - inclusion
- **Bioeconomy solutions** for all industrial markets
  - Development of climate change resilient materials
  - Development of sustainable materials, including those of bio-based origin, biodegradable or compostable
  - Development of life-cycle methodologies for sustainable systems and value chains

## Annex 2

### Technology Readiness Level (TRL) representing technology maturity levels in the innovation process from idea/lab to mass market





The European Round Table for Industry (ERT) has a long history of promoting competitiveness and prosperity in Europe. In April 1983, 17 leading European business leaders came together to launch ERT. They were then, as we are now, united by a belief that European co-operation between industry, policymakers and all stakeholders is essential to ensure Europe continues to thrive.

Today, ERT Members include CEOs and Chairs from around 60 of Europe's largest companies in the industrial and technological sectors. By facilitating cross-sectoral dialogue at the highest level, we build consensus informed by the realities faced by European companies operating worldwide. We are committed to creating a strong, open and competitive Europe through which we promote sustainable growth, jobs and prosperity for all.

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