

Policy Considerations on the future EU Framework Programme for Research and Innovation

Shaping our future based on European research...

With its mission to address some of the grand challenges for research and society, Helmholtz is dedicated to European research cooperation. Global challenges do not stop at borders - and the Framework Programme is of utmost importance to address these challenges jointly in a European way, today more than ever. European research cooperation is crucial to positioning Europe as a global leader in research and technology, to analyze and solve complex challenges and to enable social and technological development.

It is particularly important to continue investing in elements of critical relevance - such as digital infrastructures, AI-based research and data management, software and digital twins - to deepen the understanding of complex systems, to accelerate and bridge both research and innovation, as well as to provide science-based policy advice. In addition, dedicated collaborative research enables Europe to pursue its ambitious goals in the major grand challenge areas such as health (incl. translational and preventive approaches), energy, transport, environment, climate or digital transformation. New findings and technologies should be approached from a sustainable point of view and should also support Europe's sustainable development.

In view of overarching global challenges, such as climate change, the depletion of natural resources and the degradation of ecosystems, joint European research on climate and bioeconomy is a major to contribute to sustainability and food security. At the same time, we need further cutting-edge research for generating and storing renewable energy as a prerequisite for the fundamental energy transition, ultimately guaranteeing energy security. Strongly encouraging and supporting energy-efficient computing¹ is mandatory to ensure Europe's competitiveness and capability to address those complex challenges.

...and creating European added-value

Joint research at the European level must act as a driving force for a united and economically balanced Europe, for its autonomy and its sovereignty - and therefore deserves to be at the core of the political agenda. A strong joint research agenda will benefit European economy, society and thus citizens enormously both in the short and long term, beyond the capacities of individual Member States.

We stress that continuous support for research along the full research and innovation chain (incl. collaborative basic research and the ERC) is needed to achieve the goals laid out by the European Institutions. In light of the impressive investments in modern research infrastructures seen in the USA and some Asian countries, it is of utmost importance that Europe also invests in critical research infrastructures and promotes pan-European strategic cooperation among them.

To meet all these enormous challenges, an increased, very ambitious research budget is key to promoting future innovative and creative solutions - and a sustainable future for Europe.

¹ The internet and computing systems at all levels consume a large part of available energy resources and this proportion is expected to increase rapidly over the next decade.

The essentials

Excellence must be the main criterion for funding: Only excellent research and innovation efforts at an international level increase Europe's competitiveness and pave the way for establishing societal and technological progress. Therefore, excellence and international high quality must serve as the basis for the evaluation of proposals. Only this principle ultimately contributes to maintaining the international reputation of the Framework Programme and **attracting talents** from all over the world.

Collaborative research is at the heart of EU research: Collaborative research in the Framework Programme funnels innovation and creates true European added-value - beyond the capacities of individual research actors or Member States. Joint European efforts must achieve more than the sum of its parts. Collaborative European research is prerequisite for the development and implementation of European policies as well as Europe's contribution to international policies, in key areas such as public health or global change.

Research at low and medium Technology Readiness Levels (TRLs) constitutes a major pillar to drive innovation. Limiting research activities within collaborative projects to high TRLs will ultimately dry out the European innovation chain and create a new valley of death at its very beginning. Therefore, more collaborative research at TRLs 1-4 is needed and it is obligatory to link fundamental research and innovation.

In addition, collaborative research needs to have more bottom-up funding opportunities (like ERC Synergy Grants or EIC Pathfinder Open) in order to tap on the full scientific potential across Europe - followed by a rigorous evaluation of project results and subsequent complementary actions with top-down funding where applicable. Ideally, such projects would be implemented by focused and agile, smaller consortia.

For domains with high industrial impact such as materials, energy, transport or ICT research, the Framework Programme also needs to facilitate cooperation between all R&I stakeholders (industry, SMEs, research organisations/RTOs, academia and operators) as part of collaborative research and/or partnerships reaching higher TRLs - in order to support transferring research results into innovation and particularly innovative market-application. The Framework Programme benefits from concerted research and innovation initiatives by joining forces between the European Commission and public/private partners in this regard.

Enabling further progress

Future research and innovation should coherently support Europe's technological sovereignty, autonomy, competitiveness and resilience. All stakeholders should combine their resources to coordinate **multidisciplinary** and **sustainable** actions.

The Framework Programme and the European Research Area as such could benefit from **a new, more advanced and transparent portfolio-inspired approach** to support the much-needed interdisciplinarity and multidisciplinary in view of the global challenges. To address many of them properly, it is necessary to go beyond individual projects and to activate a critical mass of research and innovation capacities with a long-term perspective (like in the SET-Plan). Such a concerted approach would be assisted by dedicated programme managers and coherently bring projects together, foster their interaction, link their expertise and enhance their output on the same topic. Such a strategy would also interweave selected global challenges of the Framework Programme and Member States' initiatives/projects into long-term actions² and could even involve national funding authorities on a voluntary basis. A researched-focused

² Coordination and support actions or COST action-like projects

portfolio approach can be helpful as it is potentially more flexible and leads to results faster - while requiring less time and financial resources.

This could create a light framework for generating specific knowledge - which then can serve as a basis for higher-TRL actions.

Research and Technology Infrastructures are a magnet for talent and can serve as major elements for Europe's technology sovereignty and competitiveness: They enable the generation of ground-breaking new knowledge and provide an ideal setting to attract international scientists and stakeholders from industry both from Europe and worldwide. Infrastructures (incl. e-infrastructures) are crucial for fundamental research, but they also strongly support industry, in the roles of users, suppliers and co-developers of innovative instrumentation. In this way - and through the dedicated services provided by Research Infrastructures (RI) and Technology Infrastructures (TI) along the TRL scale -, their impact on European competitiveness is substantial. Both RI and TI play a key role as intermediaries between fundamental and applied research and later deployment to the market, and can guide the path to innovation in collaboration between public and private stakeholders. RI deserve a dedicated programme section with the potential to bridge between the pillars³ in order to increase Europe's global position. RI should be supported with an increased dedicated budget to fully exploit the contribution they can make: Funding should also be utilized for improving their CO₂ footprint, cross-fertilization and integration of interdisciplinary RI (e.g. ERICs in several ESFRI Domains), capacity development in widening countries (with funding from the respective programme part) or accommodating new emerging infrastructures suggested by ESFRI. EU funding schemes for RI should also enable organisations to attract early career talents more easily. The budget should be notably increased for joint technology and method development at the European level to keep up with increasing global competition. Also, mature communities should be pushed towards a more roadmap-based long-term strategy for technology development. Currently, important TI of strategic and political interest are mainly funded by Member States (i.e. their set-up, maintenance and upgrades).

Snapshots: How to boost the effectiveness and agility of the programme

Boosting **excellence** by:

- Doubling the overall budget for FP10 compared to Horizon Europe, in line with the European Parliament's demand.
- Strengthening the ERC with its own governance and all individual calls while expanding its overall budget - especially for synergy grants (as part of a general FP10 budget increase).
- Using funds from the Framework Programme exclusively for research and research-driven innovation. If additional new activities are to be included (like in the Missions), funds should be drawn from other, more suitable sources.

Boosting **flexibility** by:

- Leaving adequate room for bottom-up design of projects in all parts of the Framework Programme in order to utilize ideas from the scientific community to find solutions to global challenges and developments.
- Enabling flexible addition of low-TRL explorative modules to mid-high-TRL projects - and vice versa - in order to accelerate technology development and innovation and counteract a dangerous divide between low and high TRL.
- Diversifying the size and budget of projects, increasing adaptability of the projects to changing external conditions, i.e. the ability to allocate budget to subprojects.

³ As far as research infrastructures are the main representative of a dedicated configuration of the programme committee to allow for sufficient time for relevant discussions through the comitology

Boosting **synergies** by:

- Linking the research outcomes of global challenges and ERC projects with the EIC via a new and dedicated “proof of concept” funding line.
- Establishing more funding opportunities for cooperation of academia with industry at lower TRL.
- Maintaining the funding pillars but break down walls between them.
- Making it easier to implement and exploit synergies with actions in other EU programmes.

Boosting **clarity** by:

- Ensuring that top-down measures have a clear strategic focus and clear, attractive implementation rules for all actors involved, primarily for research organisations.
- Reducing the administrative burden during application and implementation of projects.
- Designing and adapting simplification measures with a major focus on the applicants, beneficiaries and third parties.
- Publishing a full Annotated Grant Agreement within the first three months of the new Framework Programme.

Reaching out

Association: It is of critical importance to enable cooperation with non-EU countries; associations of third countries to the Framework Programme are key in this regard. Hence, the extension of the associations to selected non-EU countries should continue. Ideally, it should be known which countries will be associated to the new Framework Programme before it starts. The terms of collaboration have to be clear to avoid uncertainties and administrative burden. The current approach of “you pay what you get” applied in Horizon Europe should be continued.

Widening countries: The European divide continues to be a major threat for the international competitiveness. We welcome continued funding for projects by and with widening countries. At the same time, the attractiveness of such funding instruments has to be increased for non-widening countries to promote further collaboration. Furthermore, the EU structural funds could contribute significantly more to such a funding line in future. Through a portfolio-inspired approach, public research organisations, industry and national authorities could jointly develop tailor-made activities to promote an excellent and sustainable research and innovation culture in the widening countries - while higher research spending in these countries is an important catalyst that complements European activities. Helmholtz is dedicated to the continuous promotion of long-term relationships with complementary institutions in widening countries. In the future, widening initiatives could also benefit from a tighter collaboration with large RI based in non-widening countries.

About **Helmholtz**:

We are Germany's largest research organization. At Helmholtz, more than 46 000 people work together in 18 centres and develop solutions and technologies for the world of tomorrow. With an annual budget of six billion euros and long-term, interdisciplinary research programs and unique research infrastructures we address global challenges - in our six thematic fields: Energy, Earth & Environment, Health, Information, Matter and Aeronautics, Space & Transport.