

Seizing the opportunities of European research beyond 2020

Position paper by the Helmholtz Association

Research is a key element to boost EU competitiveness and is vital for finding solutions for global societal challenges. Investing in research is of high strategic relevance for future innovation. Europe has a large number of excellent scientists and innovators across all research fields and Member States. By bringing together the best research and innovation stakeholders, their capacities and their knowledge, Europe can create synergies and capitalize on its wealth – which is where the real European added value lies. European collaboration joins the dots between national research activities, thereby making the overall system more effective.

In view of the competition Europe is facing and the massive funding increase in R&D in other countries, notably in Asia, it is essential to set the course for Europe's future well-being. In looking towards the future, the Helmholtz Association emphasizes the outstanding role the next EU framework programme could play. Europe possesses a treasure, its research capacity, that is not fully excavated yet. A well-designed and well-funded EU framework programme for research and innovation would enable us to better tap this valuable resource.

Strengthening the European Research Area by contributing to global goals

Research is the engine for new developments and knowledge in the EU. At the same time, Europe needs to remain a key player in the global context and many of today's challenges are in fact global. This is why Helmholtz recommends linking the future framework programme to the United Nations' Sustainable Development Goals and improving international collaboration.

The integrity of the European Research Area is another cornerstone in order to position Europe at a global level. One of the strengths of European research framework programmes is their tangible EU-wide commitment to foster a European Research Area which is open for all Member States. Stronger synergies between the next framework programme and structural funds could support this openness. Bridging the gaps between regions more effectively is one of the major political challenges for the coming years, and effective partnerships between research institutions can be one key. This is why Helmholtz welcomes the twinning scheme and has recently launched a European Partnering Initiative creating links between different European regions.

- The Helmholtz Association, Germany's largest research organisation, is a strong supporter of European research collaboration. To exploit the full EU research capacity, the Helmholtz Association highlights the following recommendations for the future EU research programme:

Recommendations for FP9

a) Research at heart – the core for future innovation

The European Union can build on an excellent research potential and a longstanding research tradition. The Helmholtz Association strongly urges the European Commission to bring back a clear focus on funding research activities – rather than overemphasizing market and transfer aspects – and to support the cooperation of highly gifted scientists in order to enable research to be the true frontrunner for innovation. Horizon 2020 has significantly reduced the collaboration in basic research which was the hallmark of earlier framework programmes. The next EU framework programme should concentrate more on novel ideas and game-changing research – not only in the ERC, but as key element of cross-border collaborative research – and less on fine-tuning technologies close to the market: If no research remains to be done, it should not be the task of FP9 to give the last financial shove.

Missions: Sustainable funding for addressing long-term challenges

Helmholtz is convinced that many grand challenges which today's and tomorrow's society is facing can only be solved by joint action on a European scale. Common ambitious goals can inspire both the scientific community

and the public. This is why we support the idea of missions and have already identified several R&I-missions that address major challenges and make the enormous impact of European research tangible to citizens. (For further details please see our [mission paper](#), updated March 2018.)

In order to make the missions a success and to guarantee a long-term benefit, Helmholtz considers the following issues as prerequisites:

- **If funded under a framework programme for research and innovation, the missions need to have research at their heart and will benefit from research activities on all Technology Readiness Levels. If, however, the missions are intended to serve as an umbrella for major EU innovation policies, it would be advisable to place the missions outside of the framework programme – like a true umbrella – and draw resources from various EU programmes to finance their implementation.**
- **Missions should offer a funding perspective over the duration of the framework programme. It would be advisable to support the relevant call topics e.g. over 4 + (after successful evaluation) 3 years. The potential for at least seven years of funding would allow more ambitious strategic planning and a building on results, increasing their further use.**
- **Lean governance, openness and a conclusive definition of each mission are as important as a clear link to other parts of FP9 (such as FET Flagships, see below).**
- **Different projects funded under one mission need to be well-orchestrated, so that the whole can become more than the sum of its parts.**

FET Flagships: Shaping future technologies

FET Flagships have demonstrated the need for ambitious joint endeavours for ground-breaking research that can create the basis for future key technologies. Their size and duration enable advances in fields which require a concerted effort. The debate on future FET Flagships has mobilized many communities, which have developed outstanding concepts.

- **It is essential that the future FET Flagships start as planned and continue to receive a priority funding. They should be clearly differentiated from the missions.**

Collaborative Research: Covering the entire innovation chain

The European added value is greatest where synergies within the EU offer new possibilities. This is most tangible where big challenges require the joint forces of competences found in Europe: **Collaborative research projects** bring together the best scientists as well as the most innovative enterprises in Europe, and integrate skills and competences across disciplines. They provide unique and real benefits for the European Union and cannot be funded via national programmes – the collaboration in European projects in turn cross-fertilizes the work in national projects. Uniting complementary expertise also leads to improved developments in new methodologies and standards.

- **Collaborative research (referring to research projects performed by researchers from several countries and organisations) should be the core of the next framework programme.**

Collaborative research in the next framework programme would be much more efficient if it covered the **whole innovation chain** instead of focusing very strongly on applied research. The next framework programme has to acknowledge the unique value of jointly working on ground-breaking new ideas.

- **Europe needs the game changers which arise from completely new approaches, mostly in Technology Readiness Levels 1 - 6. Basic research should not be limited to funding of excellent individuals via the ERC.**

Research Infrastructures: Sharing the best tools

Maximizing the European added value is especially relevant in the area of research infrastructures (RI) as e.g. research vessels, airplanes and satellites, synchrotrons, high performance computers or platforms providing tools to unravel the role of gene function in human disease. Excellent research infrastructures are often the determining factor leading top scientists to come to Europe rather than staying elsewhere, since breakthroughs in many disciplines depend on RI. They often require such a massive investment that joining forces at EU level is a

necessity. The EU is the only place where a programme can be set up to provide access across borders between Member States.

- **Close collaboration of research infrastructures on technological challenges is key to remaining at the cutting-edge concerning the global scale and needs to be fostered and funded adequately.**
- **Making research infrastructures accessible all across the EU and beyond is one of the success stories of the framework programmes. This programme area urgently needs higher funding. Securing the access of users from the EU 13 countries should be a priority.**

Ensuring excellent bottom-up creativity as well as mobility

The Future and Emerging Technologies open scheme (**FETOPEN**) allows collaboration across borders in any topic and in small agile projects and thus stimulates the bottom-up R&D capacity of Europe. The European Research Council (**ERC**) is a prime example for the EU added value of actions which can be carried out nationally but benefit from adding a “champions’ league” to involve the best talents and to ensure Europe-wide competition. Supporting the mobility of researchers via Marie Skłodowska-Curie Actions (**MSCA**) is another key to further strengthening the European Research Area and creating impact which cannot be achieved at a national level.

- **These schemes are of high value and need to be maintained, as the bottom-up approach is a key to kick-start new research ideas leading to future innovation. However, these schemes should no longer serve as a reason to ignore the importance of low TRL research in the other programmes, notably in the global challenges/missions.**

b) A well-financed framework – the key to success

FP9 represents the opportunity to further boost excellence and thereby increase the impact of European research results. In order to provide a functional framework Helmholtz considers the following areas to be essential:

Budget: The future harvest depends on the seed sown today.

FP9 has the potential to foster the European Research Area and to ensure Europe’s competitiveness for the years to come. Research has an integral function and Europe needs solid funding on top of – often fragmented – national research funding to keep up with the increasing global competition and take a frontrunner position.

- **Helmholtz recommends providing €120 billion for the EU’s future framework programme for research and innovation to boost the competitiveness of Europe and to create the adequate setting for the planned ambitious missions.**
- **This budget should be dedicated to civilian research. A programme for defence research should not be part of the next EU framework programme for research and innovation.**

Subscription ratio: It is a waste of resources if excellent proposals cannot be funded.

As the European Commission has pointed out, the enormous oversubscription in the first calls of Horizon 2020 led to undesired side-effects. Very low success rates are not only a waste of resources, but they also discourage top scientists from submitting. This is in sharp contrast to the purpose of attracting the best players in their fields.

- **A solid budget of € 120 billion is the first step towards ensuring that excellent proposals do not go to waste for lack of funding.**
- **Limiting the scope of calls and topics, the efficient use of two stage-calls or the reintroduction of pre-proposal checks could further reduce oversubscription.**

Co-funding principle: Reducing obstacles created by financial instruments

The Helmholtz Association is still concerned about the tendency to finance research via loans as the scope of loans is limited. The foundations for breakthrough innovations are mostly not bankable, as they require high-risk and long-term research. Loans might be useful at the very end of the innovation chain, but EU competitiveness must make the best use of all of its innovation capacity throughout the entire value chain. It should further be

noted that many relevant players do not benefit from these financial instruments since public research organisations in many Member States are not allowed to take out loans.

- **The next EU framework programme for research and innovation should primarily remain focused on co-funding, not on loans.**

Funding landscape and simplification efforts

Helmholtz fully endorses the approach “evolution, not revolution” to FP9. Continuity with regard to structures and rules allows researchers and administrators to concentrate on performing and facilitating excellent science instead of struggling with administrative aspects. Simplification should always be directed towards the benefit of the participants. The motivation for lump sums is laudable, but the practical implications need to be carefully examined: They might favour a “race to the bottom” by encouraging low-risk projects and well-established networks rather than breakthrough research and innovation, since many questions, as e.g. the precise definition of “proper implementation” remain unclear. Such pilots and novelties should thus best be offered as an option, not as an obligation. Lump sums should also not be introduced before solid evaluation of pilots has taken place. Major achievements as e.g. internally invoiced costs need to be kept and to be further simplified.

- **Helmholtz suggests making only modest modifications of structures (e.g. integrating “missions”) while still continuing to build on fruitful simplification efforts.**

Key recommendations for European research and innovation beyond 2020

FP9 has the potential to become an even bigger success story than Horizon 2020 with:

1. A budget of € 120 billion that is exclusively dedicated to civilian research.
2. A focus on areas that generate a true European added value such as Collaborative Projects and Research Infrastructures and adequate funding for these – as well as long-term Missions.
3. A decision to value, not ignore, the high benefits of research collaboration at low TRL (up to TRL 6) and to significantly increase its budget share.
4. Endorsement of excellence as the guiding principle for FP9.
5. Better strategies and simple measures to use Structural Funds for the integrity of the European Research Area.
6. Co-Funding principle: Funding via grants, not loans.
7. Further efforts to simplify the administration of EU projects for participants.

The Helmholtz Association is looking forward to an active involvement of the European research stakeholders in developing the EU’s next framework programme for research and innovation. Helmholtz publications concerning the EU research landscape can be found at www.helmholtz.de/eu-positions.

Brief portrait of the Helmholtz Association

The Helmholtz Association contributes to solving major challenges facing society, science and the economy with top scientific achievements in six research fields: Energy; Earth and Environment; Health; Key Technologies; Matter; and Aeronautics, Space and Transport. With some 39,000 employees in 18 research centres and an annual budget of more than €4,5 billion, the Helmholtz Association is Germany’s largest scientific organisation. Its work follows in the tradition of the great natural scientist Hermann von Helmholtz (1821-1894).

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