

The Funding that Europe Needs

Results Europe can achieve through unified action on the next MFF and FP9

The European Research Area, called for by the Treaties strengthens. Knowledge, researchers, and ideas circulate freely and enhance the quality of European research and innovation.

Europe hosts the best scientists in the world. They find here excellent working conditions, outstanding research facilities and infrastructures. This knowledge feeds education policies.

More funding for research and innovation

Europe has a leading role in understanding and tackling grand and global challenges, both societal and technological.

The produced knowledge is turned into solutions. The well-being of the population improves and the competitiveness of companies increases.

Beyond individual countries, Europe is recognised as being at the forefront of scientific excellence.

Science Europe Recommendations on Funding Investment, Research and Innovation, SMEs, and the Single Market After 2020



As President Juncker and Commissioner Oettinger recently stated, the next Multiannual Financial Framework (MFF) must make Europe stronger and deliver on “the things that matter most.” It must support European political goals that range from supporting the growth of European economies and the competitiveness of its enterprises, to contributing to human prosperity and development. It needs to enable Europe to address crises and solve local and global challenges.

Europe cannot meet these challenges without maintaining its capacity to produce and use knowledge through scientific, research, and innovation activities. The EU Framework

Programmes for Research and Innovation strengthen that capacity by complementing national and private investment.

The EU's next Multiannual Financial Framework and the 9th Framework Programme for Research and Innovation (FP9) should:

1. Provide adequate funding for research and innovation
2. Commit to excellence through pan-European competition
3. Provide mechanisms that translate science into innovation
4. Deliver European added value
5. Build on the activities of national research funders and performers to strengthen the research and innovation environment

Provide Adequate Funding for Research and Innovation

The next MFF should allocate more funding to science, research, and innovation. The budget earmarked for FP9 must therefore be significantly larger than the budget for Horizon 2020, and it must be ring-fenced to avoid future cuts.

Society faces several challenges related to climate change, demographic changes, and technological and digital evolutions, while global competition for resources and talent is intensifying. At the same time, Europe has fallen back to third position, behind the United States and China, in spending on research and innovation.¹

▶ The total combined EU, national, and private investment in research and innovation in Europe needs to increase to face these challenges and strengthen a competitive position. Increased national spending alone cannot compensate for a lack of funding at EU level.

▶ The average success rate in Horizon 2020 is 11.6% – and it is as low as 3% for some programmes. Almost 75% of the projects evaluated as scientifically excellent have remained unfunded due to lack of budget.² **Europe does not lack ideas, scientific excellence, and innovation potential: it lacks funding. The next MFF and FP9 must correct this.**

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SCIENCE EUROPE RECOMMENDATIONS ON FUNDING INVESTMENT, RESEARCH AND INNOVATION, SMES, AND THE SINGLE MARKET AFTER 2020

Commit to Excellence through Pan-European Competition

Competitive research funding based on scientific excellence raises the scientific quality and overall productivity of the innovation system.³ Europe-wide competition provides clear added value in addition to national programmes. However, below a critical funding threshold, success rates fall to a degree where competition loses its desired effect of attracting and selecting scientific excellence.

The European Research Council (ERC) is one of the best examples of how European added value is realised when focusing solely on excellence. The ERC fosters excellence through support to individual researchers at different career stages through the Starting, Consolidator and Advanced Grants, and to teams of researchers through the Synergy Grants. After only 10 years, the ERC's reputation, its outputs, and the results of its funded projects are outstanding: highest share of publications amongst the most cited in the world, six Nobel prizes, three Fields Medals and five Wolf Prizes, and more than 1,000 patents and inventions.⁴

- ▶ Excellence must drive the selection of all FP9 projects to make sure they go beyond the state of the art in their respective domain. It must remain the sole evaluation criterion for ERC grants. Focussing on excellence in all parts of the programme is also the best way to achieve the highest impact in the short, medium, and long term.
- ▶ Adequate funding must be granted to instruments supporting curiosity-driven science on a competitive basis, such as the European Research Council, the Marie Skłodowska-Curie actions (MSCA) and the FET Open (Future and Emerging Technologies) instruments.

Provide Mechanisms that Translate Science into Innovation

Science enables innovation: the two are closely intertwined. Fundamental research pushes the frontiers of knowledge and builds a long-term basis for innovation.

Disruptive new solutions as well as gradual innovation often derive from findings from fundamental research, and they are regularly built on technologies initially developed in publicly funded labs. A common example of this is that the development of technologies used to create smartphones was a direct result of prior public investment in chemistry, physics, and nanotechnology.

- ▶ FP9 must support the development of mechanisms linking research and technological development. Instruments within the future European Innovation Council (EIC) and the technological and global challenges part(s) of FP9, should capture disruptive knowledge to turn it into solutions and business opportunities.
- ▶ More investment and diverse approaches are needed to bring science and innovation closer to citizens and to involve them in scientific initiatives when appropriate. The positive impact of research on people's everyday lives needs to be communicated.

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Deliver European Added Value

EU Framework Programmes provide unique opportunities for research collaboration across national and sectoral borders. They enable the pooling of the most relevant expertise in international and cross-disciplinary consortia.

Collaboration to address large-scale challenges

Collaborative research in international and multi-disciplinary consortia allows for global challenges to be addressed through research at the required scale, and helps European researchers become leaders in the field.

- ▶ Collaborative projects must be the core element of the technological and global challenges part(s) of FP9. Adequate funding should provide collaborative opportunities at all Technology Readiness Levels (TRLs), including the lowest ones.
- ▶ Europe has committed to making progress towards the Sustainable Development Goals and lead the new industrial revolution. The EU budget must therefore give increased financial means to reach these objectives through strong scientific collaborations.

Strengthen the European Research Area

Reducing the innovation and development performance gap between countries will contribute to strengthening the ERA and realise the objective of the EU Treaties. Combined with national and local efforts, collaborative research in international consortia helps solve structural imbalances by increasing scientific capacity.

- ▶ Without compromising the excellence criteria or integrating geographical criteria in the FP9 calls for proposals, mechanisms must be designed at EU and national levels to enable research stakeholders from underrepresented countries to participate in and lead projects. Examples include coaching, exchanges, scientific and administrative capacity building, flexibility on the size of the expected projects, and so on.

- ▶ With adequate funding for FP9, the budget dedicated to instruments that aim to reduce the gap can be reinforced, such as Teaming, ERA Chairs, and Twinning.
- ▶ The regulation guiding the European Structural and Investment Funds must include stronger obligations regarding research and innovation activities for all EU regions.
- ▶ The collaboration opportunities for research and innovation offered by the Cohesion Policy, including instruments such as Interreg Europe), and by national initiatives⁵ must be used as a springboard to widen the participation in the FP.

A programme that provides global leadership

The international competition in the science and innovation scene is increasing. Over the last 15 years, almost 36,000 more scientists left the EU-28 than entered it. In addition, China, Japan, Korea, and the United States now account for between 70% and 80% of all patented inventions in ICT technologies.⁶

Europe must remain a leading player that is recognised as a location of excellence, which attracts people to pursue scientific careers, establish industrial R&D activities, invest in start-ups, and establish strategic partnerships. Only a unified and sizeable European programme that provides visibility and resources beyond what is possible at national level alone can achieve this.

Attracting the participation of the best non-European scientists through **international science co-operation** will allow Europe to benefit from their expertise and promote the diffusion of European values. To this end, a strong, internationally recognised EU Framework Programme, coupled with additional national efforts, is needed.

- ▶ Participation in and/or association to FP9 should be promoted and encouraged in all countries with excellent research and innovation systems.

Build on the Activities of National Research Funders and Performers to Strengthen the Research and Innovation Environment

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Ensuring the long-term health of European research and innovation requires national and EU-level investments and policies that strengthen the underlying conditions and infrastructure for knowledge creation.

To avoid unnecessary duplication, EU investments should build on the activities of national research funding and research performing organisations.

Science Europe, as the association of funders and performers in Europe, is willing to be a partner for strengthening the ERA, for example by multilateral agreements, by activities to widen participation, or by developing common policies, such as on Open Access or Open Research Data. Some of these trans-national funding initiatives could be co-funded by FP9.

Skills and careers

Research and innovation capacity are underpinned by strong national **education** systems that provide the **skills** needed in the knowledge economy, including for new professions such as data specialist. Investing in research also helps create incentives for talented people to pursue scientific careers. Attractive **career opportunities** help to keep and attract new scientific talents.

- ▶ Synergies between FP9, Erasmus+, and programmes of national funders and performers could help develop and transfer necessary skills and allow researchers and innovators to pursue trans-sectoral career paths between business and academia.
- ▶ As technology and research continue to advance, Europe must fill the skill gap if it is to remain competitive in the future. Research programmes on emerging sectors and technologies must support the development of the skills for the job market of the future.

World-class research infrastructures

EU investment in **research infrastructures** links to all objectives of the Framework Programme: excellent research, spreading research capacities, collaboration with Member States, tackling of grand challenges, international attractiveness, skills development, mobility, and innovation opportunity. Research infrastructures of pan-European and international relevance require long planning cycles and significant funding, and cannot be established by one Member State alone.

- ▶ Funding for pan-European and internationally relevant research infrastructures must be strengthened in FP9.
- ▶ European networks of national infrastructures should be established in order to guarantee access and to avoid unnecessary spending.

Open Science

Open Science increases the quality of research and the effectiveness of the science system by increasing knowledge circulation and improving the reproducibility of results. National research funders and performers in Europe have made important investments and supporting policies. The EU should continue and enhance its support to these efforts.⁷

- ▶ Adequate funding for FP9 will enable the EU to provide the necessary tools to support the implementation of Open Science policies. Tools include the ambitious European Open Science Cloud (EOSC) and instruments facilitating the involvement of citizens. The systemic implications of Open Science must be regularly assessed; implemented approaches must truly empower scientists and contribute to the autonomy and quality of science.

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1. OECD Science, Technology and Innovation Outlook 2016: <http://www.oecd.org/sti/oecd-science-technology-and-innovation-outlook-25186167.htm>
2. European Commission Communication on Horizon 2020 interim evaluation: maximising the impact of EU research and innovation, 2018: <https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-2-F1-EN-MAIN-PART-1.PDF>
3. Evidence and references are provided in: Assessment of the Union Added Value and the economic impact of the EU Framework Programmes (FP7, Horizon 2020). European Commission, 2017: http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/assessment_of_the_union_added_value_and_the_economic_impact_of_the_eu_framework_programmes.pdf
4. The European Research Council, The first 10 years, Clarivate Analytics, 2017: https://coriniumintelligence.com/chieftdataofficergovernment/wp-content/uploads/sites/240/2017/06/All_WhitePaper_EU-Research-Council_SAR_17.pdf
5. Initiated by the Max Planck Society, the Dioscuri Programme aims to create centres of scientific excellence at host institutions in Central and Eastern Europe. Starting in Poland, Dioscuri is jointly managed by the Max Planck Society and the National Science Centre, Poland, and mutually funded by Germany and Poland. The Promys programme from the Swiss National Science Foundation supports young scientists in eastern Europe after they have studied or worked in Switzerland. The EEA Grants fund research projects in seven beneficiary countries to increase research capacities and the application of research results.
6. OECD Science, Technology and Industry Scoreboard 2017: http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2017_9789264268821-en17
7. For instance: to facilitate the sharing of data and its reuse, the European Commission should rely on the research data management protocols that will be developed on the basis of the Framework set up by Science Europe. See the Science Europe Guidance Document Presenting a Framework for Discipline-specific Research Data Management, 2018: <http://scieur.org/framework-rdmps>

Science Europe is an association of major European Research Funding Organisations and Research Performing Organisations. These Research Performing Organisations are among the main beneficiaries of the EU Research and Innovation Framework Programmes. The Research Funding Organisations have decades of experience in setting up world-leading research programmes and collaborate with the EU, notably through common or co-funded initiatives.

Through Science Europe, these organisations collaborate in order to complete the development of the European Research Area, and speak with one voice on topics of common interest.

More information on the mission and activities of Science Europe is provided at www.scienceeurope.org.

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