Federal Ministry
of Education
and Research

Freiheit
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The European Research Area and the Funding of Research and Innovation by the European Union

A contribution to the policy debate

– Translation –

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Background and motivation

Europe's competitiveness and ability to meet its future challenges will depend very much on how strong it is in research and innovation (R&I). Creativity, adaptability, and the will to innovate are all critical criteria for success in these areas. If the Member States are to have scientific excellence and a competitive economy, they need robust and sustainable EU framework conditions.

The question of how the European Research Area (ERA) develops in the coming years and how it reacts to new opportunities, particularly digitalization, will gain considerable significance. Horizon 2020 is a central instrument for realizing the ERA. The priorities which the EU will set under Horizon 2020 and possible follow-up programmes will set the course for Europe's research and innovation strength.

In this context, a range of proposals and ideas to further develop joint involvement are currently being discussed within the Member States and the bodies of the EU. This discussion is necessary and timely.

The Federal Ministry of Education and Research (BMBF) wants to provide an early contribution with this position paper.

The European Research Area

1. Continue to shape the European Research Area together

- The development of the ERA is a long-term project of the EU as set out in Article 179, paragraph 1, TFEU. The success of the ERA results from the shared responsibility of the Member States and the European Commission. The ERA is the legal anchor and framework of the common research policy efforts of the Member States, the national scientific players and the European Commission at European level. And it must remain so in practice.

- Considerable progress has been made since 2008 in the individual ERA priorities, for example through the implementation of ten Joint Programming Initiatives or the building and operation of research infrastructures to serve the interests of Europe as a whole. The Member States once again demonstrated their ability to act with the adoption of the ERA Roadmap in 2015. Every Member State is expected to support the development of the ERA through its own national strategy and concrete measures. The European Commission continues to be called upon to support the Member States adequately in their efforts.

- Germany is currently at the stage of implementing the National Strategy on the European Research Area, which was adopted in July 2014. German research and intermediary organizations already show a high degree of compliance (90 percent) with the ERA's policy priorities according to the ERA Progress Report for 2014. For example, we in Germany are looking to improve the conditions for researcher mobility or gender equality still further.

- The ERA is itself subject to transformation. It must drive developments and also react to global changes. It will only be able to maintain its dynamism if the Member States and the European Commission develop a common understanding of how its performance can be strengthened both internally and externally. This also includes greater interaction with the European Higher Education Area.

- We welcome the proposal of the European Commission to hold another ERA conference in 2016 together with all the Member States to review progress and look to the future. The aim here above all is to produce a clearer outline of the common agenda in the ERA for the next few years and to combine strengths effectively.

- A reliable system to monitor developments and progress in the ERA is needed more than ever. The existing monitoring system therefore needs to be continuously upgraded. In doing so, the quality, political relevance and utilization of the data from the previous monitoring must be subjected to independent evaluation. In addition, the monitoring should comprise aspects of the ERA Roadmap as well as of Open Science and Open Innovation. Against this background we welcome the efforts of the European Commission and the OECD towards greater cooperation in the area of monitoring. We regard the initial arrangements merely as a first, necessary step. We should aim to utilize more synergies in data collection than is the case so far. Among other benefits this will reduce the burden of the Member States and their

organizations in the area of international reporting obligations without reducing the quality of the data collected.

2. Expand multilateral activities

- Activities that bring together national and European R&I activities and align them to common aims are an essential and successful element to further deepen the ERA. Thus measures in accordance with Article 185 TFEU, the Joint Programming Initiatives and many ERAnets have been implemented successfully in the last few years. They should remain the central core of the Member States' involvement.

- The Member States are called upon to synchronize and to harmonize the various funding procedures as far as possible where European collaborations are involved. These efforts must be intensified in the coming years. For example, the European funding regulations of the next Framework Programme agreed by the Council and the European Parliament could also apply to the administration of national funding for future Article 185 measures from 2020. Eurostars 2 should serve as a pilot programme for this. However, this depends on considerably simplified rules for funding at European level which will reduce the administrative costs for cross-border project consortia. This applies especially to SMEs and will facilitate their participation.

3. Ensure independent scientific policy advice

- The establishment of the Scientific Advice Mechanism (SAM) in the European Commission underlines the great importance of independent, evidence-based scientific policy advice.

- We welcome the approach towards more structured cooperation with the scientific advice bodies of the Member States and stronger inclusion of the national academies of science. This approach must take account of the different national systems of scientific advice. It is important that processes are transparent. Furthermore, the roles of the players such as the SAM, the Joint Research Centre (JRC), and the European Political Strategy Centre (EPSC) need to be clearly defined.

- An essential feature of good policy advice is that uncertainty and divergent opinions are given appropriate consideration. Professional process management is required to deal with any such uncertainty or divergent opinions and to do so with the required transparency. The design of the advisory processes should therefore include adequate expertise.

4. Strengthen national commitment to research and innovation

- Europe's competitiveness depends to a decisive extent on effective national R&I systems. Strong national systems mean strong international competitiveness. Thus, an adequate financial commitment at national level is required. The 3 percent of GDP target jointly set for R&D investment requires all Member States not to let up in their national efforts.

- The support provided by the EU is no substitute for national commitment. Europe depends on the commitment of each individual Member State and the diversity of research topics. This power of the national systems must not only be preserved but also enhanced.

5. Strengthen EUREKA and COST as pillars of the ERA

- European Member States have been successfully coordinating national funding together with the European Commission via the two intergovernmental organizations EUREKA and COST for many years. EUREKA and COST complement the portfolio of intergovernmental innovative research in Europe.

- Important strategy processes are currently taking place in both organizations with the aim of embedding EUREKA and COST more firmly in the ERA. We support these efforts because, in our view, both are integral components of the ERA. Thus it is important to coordinate more closely what the EU offers and what EUREKA and COST offer in order to be able to use the different contributions toward deepening the ERA efficiently and to optimum effect.

6. Shape external relations together

- We welcome the fact that the European Commission has declared the EU's external scientific relations a research policy priority under the mottoes "Open to the World" and "Science Diplomacy". However, the science diplomacy approach is not sufficient on its own to be the main driver of international cooperation which is characterized by the science and quality-driven cooperation between states. Europe needs this science-driven worldwide cooperation above all in order to maintain its place among the academic elite, to secure its long-term competitiveness on the global markets, to be able to recruit young scientists worldwide, and to work out solutions for global challenges.

- "Open to the World" also means to promote international academic mobility. European students, doctoral candidates and researchers are to be given an opportunity to gather experience worldwide and build lasting bridges to partner countries. For the purpose of lastingly securing the required skills in a shrinking European labour force, openness to the world also means inviting and integrating students and young scientists from third countries to Europe on a temporary or permanent basis. To that end, a European exchange of experience is needed on initiatives to strengthen a culture of welcome at universities and research institutions.

- External scientific relations and international research cooperation affect the core competences of the Member States. Therefore we need a coordinated approach by the European Commission and the Member States in relation to third countries. We must work together more closely than before to define and implement strategic goals in order to achieve a new quality of EU-third country cooperation. This also requires joint decision-making about target countries and regions.

- We note that the European Commission has proposed Latin America, Asia and the South Atlantic as relevant partner regions. This proposed prioritization requires explanation and an intensive dialogue between the European Commission and the Member States particularly in

view of the transatlantic partnership and other important regions. The European Commission should agree its activities – as well as further priorities for international cooperation – at an early stage with the Member States in the Strategic Forum for International S&T Cooperation (SFIC) in accordance with the Council conclusions of 2 December 2008 concerning a European partnership for international scientific and technological cooperation. Adequate involvement of the Council in all the phases of the negotiations must also be ensured in the negotiating mandates. The BMBF will review the extent to which its third country policy must be updated and developed in relation to external EU policy. This applies in particular to thematic fields within which German interests can be represented in European initiatives for third country cooperation in order to create critical masses together with other Member States and thus to be better able to assert common interests particularly vis-à-vis the other global economic regions.

- We consider it necessary to improve the possibilities for mutual participation by the European Commission and the Member States in policy dialogues and regular bilateral negotiations at government level on R&I.

European research and innovation funding: Horizon 2020 and beyond

7. Innovation depends on a strong research base

- Horizon 2020, the EU framework programme for research and innovation, puts a greater focus on supporting innovation than earlier framework programmes. In doing so, it makes an important contribution to Europe's competitiveness by paying greater attention to the potential for exploitation and application of research results. Furthermore, it sees R&I as part of an overall system.

- However, we must not overlook the fact that research forms the basis of innovation. Thus in future, we will have to focus much more attention on providing European support for innovation which ensures an appropriate and effective balance between strong basic research, application-oriented and industrial research and research which addresses societal challenges. As such, collaborative research can form the bridge between basic research and applications and therefore must not have an overly one-sided orientation to applications. Innovation support should focus on the generation of basic knowledge as well as on measures for market implementation. After all, marketable innovations can only be achieved in the medium term if the basis is provided by research.

- The establishment of the investigator-driven European Research Council (ERC) created a Europe-wide competition for excellent minds, ideas and locations. In the meantime it has a worldwide profile and is aligned to the core principles of European research policy: excellence, internationality and freedom of research. Since ERC funding is increasingly being taken as a benchmark for the purposes of comparing international research locations, and is becoming a mark of excellence both for institutions and individual scientific careers, the ERC

is of outstanding importance in European research funding and should continue to be strengthened.

- Germany is open to the proposal of establishing a European Innovation Council (EIC) but sees a need for further clarification, particularly with regard to the analysis of existing innovation instruments and their efficiency. There needs to be a clear definition of the gap which an EIC can and will be expected to close. Germany considers as inappropriate a system which copies the excellence-based individual funding of the European Research Council (ERC) onto the innovation system. On the other hand, the cluster approach has proven effective in the field of innovation. It should be examined how the approach of the European Institute of Innovation and Technology (EIT) can be strengthened, enhanced and, if appropriate, developed into an innovation label that also covers the other innovation support measures within Horizon 2020. Against this background, we are also in favour of a critical review of the European Innovation Partnerships (EIP). The further development of existing instruments in the area of innovation should also be undertaken with the aim of strengthening and facilitating participation by SMEs.

- Access to excellent research infrastructures must be ensured in order to operate at the forefront of international research and to attract the best minds. Opening up the most important research infrastructures across (internal) European borders is one of the great achievements of the European framework programmes. Support for joint work at research infrastructures in Horizon 2020 should therefore be strengthened.

- Individual international experience gained by doctoral candidates and researchers helps to expand their horizons, promote research networks and accelerate communication and exchange in the research field. The Marie Skłodowska-Curie actions (MSCA) programme has been making a successful contribution to this for many years and must be further strengthened. This can also increase the participation of researchers from the EU13 states. National funding programmes which aim to promote international scientific exchange also contribute toward these objectives.

- The civilian orientation of the research in Horizon 2020 must be retained in the succeeding framework programme.

8. Further simplification under Horizon 2020

- Germany continues to support the shared aim of the European Commission and the Member States to simplify the design and rules of participation of EU research programmes. The transition to Horizon 2020 has brought initial successes in this context and these are benefiting applicants.

- However, the introduction of new instruments (e.g. the Framework Partnership Agreements or the European Joint Programming measures) contradicts this goal. New instruments should have clearly unique features and added value compared to established instruments as well as be clearly distinguishable and complementary to established procedures. The total number of funding tools should not be increased; if anything it should be reduced.

- Certain key topics from the Horizon 2020 pillars Industrial Leadership and Societal Challenges are addressed by several different instruments (e.g. Knowledge and Innovation Communities (KICs), European Innovation Partnerships (EIPs), Joint Technology Initiatives (JTIs) or Eureka Clusters). This causes inefficient redundancies in some cases, with consequent administrative overburdening of the participants. As a result, even big Member States are having increasing difficulties in making effective use of the multitude of instruments that exist.

9. Place the participation of Member States on a broader basis

- There are currently wide variations between the Member States in terms of the level of both their participation and successful securing of funding from outside sources. Even if the concentration of funding on a few Member States can be explained to a large extent by the strength of the national R&I capacities of these countries, there are other factors which also influence this imbalance.

- The programme part Spreading Excellence and Widening Participation, which is new to Horizon 2020, makes an important contribution to strengthening the participation of previously under-represented regions. However, it is insufficient in its present form. Further efforts are required by both the European Commission and the Member States in order to make progress in this area. We favour strengthening the existing programme part in Horizon 2020.

- However, those Member States which have so far been under-represented in Horizon 2020 are expected to make greater efforts to increase the competitiveness and excellence of their national research locations. Of particular importance is national investment in higher education, research and innovation as well as efforts at structural improvements (university autonomy, quality assurance in research and teaching etc.). In addition, there must be greater use of the European Structural and Investment Funds and the newly established European Fund for Strategic Investments (EFSI); their use must complement the national R&I funds for innovation-oriented activities.

- The BMBF is prepared to provide support for Member States which are under-represented in Horizon 2020 via special programmes based on existing cooperation with these countries. We welcome similar commitments by other Member States.

10. Strengthen collaborative research in Horizon 2020

- European collaborative research is a core element of Horizon 2020. Cooperation between the best European research players in collaborative projects and the resulting exchange or shared use of knowledge, methods, infrastructures and data represent the decisive added value of EU research support. Furthermore, the rule that collaborative projects must involve the participation of at least three partners from three different Member States or Associated Countries should be maintained.

- Furthermore, collaborative research projects offer the best means of gaining entry into European cooperation networks for new players, particularly SMEs. Collaborative projects

provide the required incentives for researchers to work together across national borders. This aspect should also be taken into consideration in SME funding.

- This is why the joint cooperation of players from several countries in collaborative research must also be the identifying characteristic and the core of European research funding in future.

11. Promote excellence and competition while ensuring reasonable chances of success

- Under Horizon 2020, competition for projects and funds has become tougher than under its predecessors. The degree of over-subscription in the various Horizon 2020 programme sections varies widely. The aim of supporting only the most excellent applications, which have prevailed in an open competition, must not be called into question. However, if the prospects for success are too low, this also has a deterrent effect on excellent European R&I players since submitting applications for funding involves considerable costs and there may be alternative national possibilities of funding.

- The measures introduced for the next work programmes or calls for proposals, such as two-stage selection procedures with adapted minimum thresholds or a sharper focus of the individual call texts are important steps to address these problems and to counteract a possible dwindling of acceptance for Horizon 2020. The success of the measures should be examined closely so any necessary adjustments can be made.

- The “Seal of Excellence” can be a sensible component to open up alternative possibilities for funding (e.g. from the European Structural and Investment Funds) for applications which have already been assessed as being excellent. It must be at the discretion of each Member State to decide whether it recognizes the Seal of Excellence for its national funding programmes.

12. No substitution of grants by loans

- Providing credit finance for R&I represents an important contribution to increasing Europe's competitiveness and innovativeness. EFSI, which can also provide finance specifically for R&I projects, is making considerable sums of money available for the loan financing of R&I over the coming years.

- However, within the framework of Horizon 2020, care should be taken to ensure that loan-based financing is not further expanded to the detriment of grant-based R&I funding. The broad funding of research can be especially successful if the financial risk inherent in research is borne via grants. In our view, any further substitution of R&D grants by loans will not have the desired effect. There is a danger that loan-based finance will lead to less-risky projects. The use of financial instruments within Horizon 2020 should be limited to areas which are close to market such as industrial demonstration and commercialization projects.

The role of digitalization

13. Develop digitalization as a driving force also at European level

- The worlds of education, research and science are developing key components for the Digital Single Market. Key technologies, such as ICT and production technologies, enable innovations for a digital economy. Concrete fields of application are emerging in topics such as Industry 4.0, cloud computing and big data. Commercialization would not be possible without research, innovation and relevant infrastructures. At the same time, the transformation of the economy to Industry 4.0 must also enable the targeted building up of digital skills in the labour force.

- Questions concerning IT/cyber security, operational safety, high-speed digital transmission and intelligent use of data are of central importance for the whole of society. IT solutions must reliably protect data and communication against attacks, spying and manipulation. The development of secure and trustworthy IT systems is a task for research and science. They are a prerequisite for making use of the opportunities offered by digitalization and for securing the basic democratic order of the EU.

14. Harmonize and simplify copyright at European level

- We welcome the initiative of the European Commission to adapt European copyright to the requirements of digitalization and networking. The aim is to appropriately reflect changed models of intellectual creation, exploitation and commercialization including in the EU's copyright acquis.

- The intention of the European Commission to create greater legal certainty in the cross-border exploitation of content for education and research purposes through harmonized exemptions is welcomed by Germany. However, under no circumstances may the existing exemption for education and research be reduced in scope by a reform of the Copyright Directive. Together we must ensure that modern possibilities for exploitation such as text and data mining are available to science, education and research, and that the production, management, use and dissemination of data stocks is enabled even across national borders. There is an urgent need for action here. The existing regulatory framework is unable to provide effective support for cross-border research because it is too complex.

- One important step towards creating more research-friendly copyright was achieved in Germany with the introduction of an indefeasible right of secondary publication for scientific authors. This provision represents a step towards strengthening open access and is now also being considered by other Member States. It could also serve as a model for a European provision.

15. Provide greater funding for Open Science

- The possibilities for the digital participation of different groups in scientific work, for example via such approaches as Open Science and Science 2.0, facilitate exchange and cooperation with business and society. Member States and the European Commission should in future together integrate this central dimension more closely in the existing ERA initiatives, while taking account of the restrictions which apply to near-market research. What is needed are suitable framework conditions which take account of the diversity of science-led initiatives. Furthermore, the aspect of scientific integrity is given new relevance in the context of Open Science as the basis for research excellence and trust in research. However, we see the principal responsibility residing particularly with the scientific players themselves.

- Straightforward access to scientific insights is the prerequisite for every research activity but also for the transfer of scientific findings to business and society overall. Open access contributes to a better flow of information in science and to improved visibility of research results. Publications which result from publicly funded research are therefore expected to be published for open access.

- The digital transformation is creating completely new possibilities to exploit research data well beyond the original research purposes. Broad availability of research data promotes new insights and innovation. Access to research data should be designed to be as open as possible, but also to take account of all legitimate interests and opportunities and risks for European competitiveness. In order to promote the strategic goal of Open Science, investment is needed in storage capacities as well as in projects to implement data management plans.

- Europe needs effective information structures which are able to compete internationally. This is why we in principle support the proposal for a European Science Cloud. To that end, we must create optimal conditions for the collection and long-term storage of data and knowledge. But we must also enable their use across borders and across disciplines. Any European initiatives should build on existing national activities. At European level, the exchange of experience should therefore also be expanded to take account of international initiatives such as the Research Data Alliance. Consequently there needs to be clarification of questions about the necessary framework, for example in the form of uniform standards. We must ensure compatibility with national and international initiatives at every phase.

- Increasing digitalization also facilitates the creation of virtual research networks. We regard these virtual research networks as a useful addition but not as a substitute for supporting regional clusters, which represent the nucleus of successful innovation policy at national and European level. In this context, we should also give greater consideration to the possibilities for funding the digitalization of research in European structural policy.