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Beyond the Horizon:

LERU's views on the 9th Framework Programme for Research and Innovation

LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES

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About LERU

LERU was founded in 2002 as an association of research-intensive universities sharing the values of high-quality teaching in an environment of internationally competitive research. The League is committed to: education through an awareness of the frontiers of human understanding; the creation of new knowledge through basic research, which is the ultimate source of innovation in society; the promotion of research across a broad front, which creates a unique capacity to reconfigure activities in response to new opportunities and problems. The purpose of the League is to advocate these values, to influence policy in Europe and to develop best practice through mutual exchange of experience.

Executive summary

This paper is LERU's contribution to the development of ideas on the next European Framework Programme (FP) for Research and Innovation (R&I), hereafter referred to as FP9. With this paper, LERU seeks to go beyond general principles and come up with concrete proposals on how to organise FP9, to make the next FP for R&I even more efficient and focused than the current one, generating impact on society and European competitiveness, in both the short and long term. The LERU member universities are, and have been for many years, among the top performers in EU research FPs. This paper is built on their expertise. LERU is looking forward to discussing the ideas set out in this paper with the European Commission (EC), members of the European Parliament and Council representatives. LERU will engage with the European institutions, providing suggestions and comments, in every step of the development of FP9.

LERU strongly supports the EU Framework Programme for Research and Innovation. Research should (continue to) be one of the core activities of the EU, post 2020. The FP has a clear EU-added value because it generates an EU-wide competition for excellence, stimulates mobility of researchers and funds collaboration to jointly address global challenges and to stimulate innovation. The FP plays a crucially important role in fostering a coherent, internationally competitive European research landscape. It is an important instrument for realising the European Research Area (ERA), setting out frameworks and goals for EU funding and so influencing Member States to introduce structural reform in order to head in the same direction.

For FP9 LERU has the following key messages which are crucially important for FP9's attractiveness, influence and impact, in Europe and beyond:

1. The European Framework Programme for R&I brings real value to the EU. It should be funded appropriately. If FP9 is to be an ambitious FP that provides decent funding and support for knowledge creation and innovation in different ways, through different programmes, a **budget of at least EUR 120 billion**, is needed.

2. The European Research Council (ERC), Marie Skłodowska Curie Actions (MSCA) and the Collaborative Research and Innovation programme should be the **cornerstones of FP9**. Support for innovation should be a policy but not a funding priority.

3. The **excellence** of the work proposed should (continue to) be the main selection criterion for funding in FP9. LERU considers the impact of FP funded projects to be very important, but emphasises that the impact of projects should never prevail over the quality of the proposed research and/or innovation work. In FP9 the EC should broaden its views on impact, as a dynamic, open and networked process and on innovation, including social and societal innovation.

4. FP9 rules should be built on an increased **trust** in beneficiaries, especially if they have well- established robust accounting and project management practices in place.

5. LERU strongly supports the **ERC** and the continuation of its excellent work in FP9, supporting considerable increase of its budget and focusing the majority of its activities on the Starting, Consolidator and Advanced grants.

6. **MSCA** should have a central role in FP9 and needs a significantly increased budget compared to current levels. Initial Training Networks and Individual Fellowships should form the core of the 'Actions' in FP9. MSCA should become part of the Research Commissioner's portfolio in the future.

7. LERU advocates bringing all collaborative funding together in FP9, creating one strong **collaborative research and innovation programme** that aims at funding interdisciplinary, international and cross-sectoral projects.

8. Funding for collaborative research and innovation activities should be **spread in a balanced way between early stage, medium and advanced activities**, thereby ensuring the process is constantly fed off new ideas and insights. The funding should be allocated to broad topics, defined **bottom-up**, as well as to specific calls, defined **top-down**.

9. Instead of the current externalisation of ERA-nets and Joint technology initiatives, LERU proposes replacing them with a system of **co-funding collaborative R&I calls by public and private partners**, aiming at keeping these schemes within the FP, allowing for increased transparency and accessibility.

10. **Widening participation** to the FP remains important, whereby the focus and action should be on developing synergies between FP9 and European Structural Investment Funds (ESIF). A specific part of ESIF should be earmarked to this end when the ESIF post 2020 is developed.

Other important, more detailed recommendations on FP9 are:

General aspects

- Universities are key actors to build a knowledge-based society and to enable innovation in Europe. They are at the beating heart of R&I. The funding schemes, set-up and rules of FP9 should stimulate universities, and their best researchers to participate.

- FP9 should focus on funding research and innovation, but also seek to stimulate education – as an important third side of the whole knowledge triangle, e.g. through the development of synergies with the successor of Erasmus+.

- Given continuation of rules is simplification in itself, LERU recommends maintaining as much as possible H2020 rules of participation, changing only what really needs improvement and involving experts in financial reporting from experienced beneficiaries when preparing these changes.

- FP9 should award the vast majority of its funding through research grants, using financial instruments only for close-to-market projects and if beneficiary appropriate. Also a move towards output-based funding should, if introduced, be limited to close-to-market activities.

ERC

- ERC should remain part of FP9 but with guaranteed autonomy vis-a-vis the EC. ERC policy should continue to be designed by, monitored by, and managed for researchers.

- Next to Starting, Consolidator and Advanced grants the ERC should certainly continue the successful Proof of Concept scheme.

MSCA

- The EC should not introduce measures in MSCA that potentially weaken a competition for excellence. At the same time, synergies between MSCA and ESIF should be developed.

Collaborative R&I programme

- In the collaborative programme a majority of funding should be spent on broad topics that result from a bottom-up consultation process and fit within a predefined set of challenges, aligned with the UN sustainable development goals. Next to these, top-down calls should be issued to address emerging issues or to complement the bottom-up topics.

- The EC should organise the clustering of related (collaborative) projects, funded by the FP, generating an exciting opportunity for knowledge exchange and leading to an increased impact of the research funded, and to accessible impacts to business and the wider public.

- The EC should develop follow-up funding for FP funded, collaborative projects, similar to the Proof of Concept scheme of ERC.

- The EC should continue to monitor participation from researchers from Social Sciences and Humanities and guarantee their involvement both in the expert groups that select the bottom-up topics as well as in the evaluators chosen to select applications for funding.

- FP9 should be open for association to countries that are of strategic importance to the EU's R&I landscape and should stimulate the participation of third countries in collaborative projects, preferably through reciprocal agreements similar to the current one with National Institutes of Health (NIH) in the US.

Evaluation

- A robust, transparent evaluation system in FP9 is needed. LERU proposes a system of standing evaluation panels, complemented with remote reviewers. Detailed briefing of reviewers, monitoring of evaluations by the EC and open and transparent feedback to applicants about the evaluation of their proposal are crucial.

- Where only remote evaluations are used, such as in MSCA, the EC should introduce at least virtual consensus meetings, to ensure a high quality process to which each expert can fully contribute. However, LERU remains in favour of continuing as much as possible face to face consensus meetings, which are a critical part of the evaluation process.

Innovation instruments and EIC

- Together with state aid, tax policy, public procurement and venture capital, FP9 has a crucial role in setting up the framework conditions that are needed to enable a stimulating European innovation ecosystem. The EU needs a systemic approach to innovation.

- Academic innovation experts need to be appointed on to the board of the European Innovation Council (EIC) as soon as possible.

- EIC's primary role should be to advice the EC on innovation policy and on the development, use and efficiency of the EC's innovation instruments. Streamlining and optimising these instruments should be a key responsibility of the EIC.

EIT

- The EIT needs to maintain a good degree of independence from the EC but, given its important role in the EU innovation landscape, needs to become part of the portfolio of the next Commissioner for Research and Innovation.

- In FP9, the EIT should focus on completing its reform, especially regarding its governance and organisation, on consolidating its role as transformation and translation agent and on supporting the activities of the existing KICs.

Widening

- The EC should incentivise Member States to reform internally systems that currently hamper institutions in these countries to participate to their full potential in the EU R&I FP.

- When ESIF post 2020 is developed, a fixed percentage of the ESIF should be earmarked for synergies with FP9. Possible areas to exploit these synergies are: seal of excellence, EIT RIS partnerships, return phase for intra-European MSCA fellowships, co-funding of basic infrastructure in MSCA COFUND activities and co-funding of certain topics as a public partner in the collaborative R&I programme.

- The EC should develop a model of a minimum salary for the 100% reimbursement of personnel cost.

Responsible Research and Innovation (RRI)

- Europe requires continued efforts to promote research integrity and FP9 rules and grant agreement should clearly define the RRI standards that are required. This should, however, not result in tick-box exercises or heavy-handed regulatory approaches.

- In FP9 the EC should continue its push for gender equality and gender mainstreaming. Long-term monitoring of gender equality is crucial.

- Ethics should be considered and funded as a proper domain of research that systematically develops excellent research on questions of science and innovation.

Open Science

- Insofar as possible FP9 should support the main lines for action of the European Open Science agenda.

- In FP9, the EC should continue the H2020 approach regarding the openness of data and open access to publications. Measures to ensure compliance with provisions for open access to publication and research data should be taken. Funding to facilitate the take-up of new open access publishing models and presses, and to encourage exchange of ideas, should be introduced.

Research infrastructures

- FP9 should introduce a set of principles for research infrastructures, aiming at transparency in information and access policies, solid embedding in existing organisations and clear indicators for operational and scientific excellence.

Other EU research funding activities

- FP9 rules should apply as much as possible to fund all research activities supported by the EC, including those in programmes from other Directorates-General/ policy fields. Extremely problematic is the liability of the coordinator for partners' activities in some of these programmes.

Defence research

- The EU's defence research programme should not be part of FP9 as the modalities and beneficiaries of the programme will differ too strongly from FP9.

1. Introduction

An EU Framework Programme for research and innovation brings real value to the EU!

At a time when the EU budget is under severe pressure and EU-added value of policies and initiatives is being scrutinised by Member States and citizens, the Framework Programme (FP) for research and innovation has increased its impact and influence in the European Research and Innovation (R&I) landscape. The FP is especially important because it is a proven, successful way of tackling global challenges on a European and international scale and because it is an efficient, long-term investment in the European as well as national economies. FPs have helped define 'science' in Europe, they have significantly contributed to the development of a seamless, local, national and international research community and they have been the backbone of European competitiveness and sustainability. Research and researchers are the ultimate drivers of innovation. FP9 needs to maintain high-level funding for research in an innovation ecosystem to ensure it continues to make a meaningful difference for Europe and the world. The FP activities have a clear EU-added value, which cannot be simply replaced by funding at Member State level.

The high volume of proposals submitted to Horizon 2020 demonstrates there is an enormous interest in the Framework Programme and a real need for the funding it offers. Funding for research and innovation (in all stages of development) and for supporting international mobility of researchers and students should be a top priority in the next Multi-annual Financial Framework (MFF). European policy makers should recognise and value the success of the R&I FPs, starting with implementing the goal they set in Lisbon, dedicating at least 3% of the overall EU budget to research and innovation. LERU considers a budget of EUR 120 billion a necessity for FP9 to meet all its aims and serve all its purposes. Education activities, through the successor to Erasmus +, should also receive appropriate financial support.

The Framework Programme is an important instrument for realising the European Research Area (ERA). By setting out specific targets or developing frameworks, for instance on gender, research integrity and open science and by supporting researchers' mobility and research infrastructures, the Framework Programme can gradually support or steer Member States and other research funders in a common direction. LERU is and has always been a strong supporter of ERA (see e.g. LERU: 2014), for instance as one of the ERA stakeholder platform members, and is in favour of a continued push by the EC and the Member States for the realisation of ERA. On the occasion of the EU's 60th anniversary, LERU issued a statement, together with the other European major science organisations, emphasising the need for a reinforced role for ERA in the EU of tomorrow[1].

FP9 cornerstones and EU-added value

Research is a truly international endeavour. Researchers themselves are mobile – an international experience is considered an essential part of a research career in many European countries - and research knows no borders. Developments in the area of Open Science will further increase cross-border collaborations in the future. These internationally focused activities cannot be funded to the same extent by national or multilateral sources. Therefore collaborative research and innovation funded by the EU has a clear EU-added value. FP9 should certainly invest a large share of its funding in these activities. More detail on LERU's ideas for collaborative research and innovation can be found in section 5 of this paper.

In the 10 years since its foundation, the European Research Council (ERC) has become the internationally recognised benchmark for excellent researchers. It has created an international competition for excellence, allowing researchers to compete with the best across Europe and beyond, having had their projects evaluated by eminent international panels of experts. The ERC also addresses a need in Europe, by funding frontier, predominantly blue skies research and needs to continue to fund this type of research as one of the key programmes of the EU research and innovation Framework Programme. More detail on the ERC in FP9 can be found in section 3 of this paper.

A third fundamental part of FP9 should be the Marie Skłodowska Curie Actions (MSCA). The support MSCA provides towards the mobility and career development of researchers has been highly valued by researchers and institutions in Europe and worldwide. By stimulating

1 http://www.leru.org/index.php/public/news/new-momentum-for-the-european-research-area/

mobility and career development MSCA contributes directly to the realisation of the European Research Area (ERA). The programme therefore has a clear EU-added value. LERU is convinced MSCA should play a central role in FP9 and be funded accordingly. For MSCA to have a central role in FP9, it is important that only one Commissioner and Directorate-General will be responsible for all parts of FP9, including MSCA. LERU's detailed views on MSCA can be found in section 4 of this paper.

The EU should also continue to stimulate and support innovation through FP9. Although only a minor share of the FP9 budget should be dedicated to funding pure innovation activities, the EC's effort to reduce barriers to innovation, to bring research results to the market and to build innovation management capacity for Small and Medium Enterprises through the R&I Framework Programme should certainly be continued. FP9 has a role to play in developing the adequate framework conditions for Europe's innovation potential to fully develop (see section 7).

FP9, the knowledge triangle and universities

Investing in universities pays off. It is not an empty statement but one that is supported by, amongst others, the impact study of LERU member universities, undertaken by BIGGAR Economics in 2015 (LERU: 2015a). The study estimates that in 2014 (the then 21) LERU universities generated a total economic value of €71.2 billion in GVA and 900,065 jobs across Europe. For each €1 in GVA directly generated by LERU universities, there was a total contribution of almost €6 to the European economy and every job directly created by the LERU universities supported almost 6 jobs in the European economy. One way in which universities contribute to the economy is by playing an important enabling role in the innovation process when it comes to creating an environment that allows innovation to flourish. Research-intensive universities in particular are hubs of creativity attracting research-intensive companies and investment into a region. Universities, especially through the strong technology transfer offices they have developed, catalyse innovation in local businesses (LERU: 2010). Naturally, universities also make key contributions to society by training the next generation of world leaders, administrators, entrepreneurs and researchers.

In these times of uncertainty reliable information for decision-making has become increasingly important, and thus the ability to distinguish between facts and fiction. Universities, through the research they do and the education they offer, are more important than ever to ensure the stability and resilience of our society. When developing FP9 EU policy makers should keep in mind universities' core role in society and the economy and aim at encouraging and supporting their participation in FP9 activities. Universities are the driving force of R&I and are key institutions for the success of the programme. Crucial to this is including funding for excellent, investigator-driven research, both individual and collaborative, and the continuation of a stable funding model that reimburses actual costs incurred without increasing financial uncertainty or adding/shifting red tape.

FP9 should focus on funding research and innovation activities, and at the same time seek to stimulate education and engagement with society. The European Institute for Innovation and Technology (EIT) already aims at integrating the three sides of the knowledge triangle but LERU suggests the EC looks at additional routes to link FP9 research and innovation activities in general with education. In its position paper 'Excellent education in research-rich universities' (LERU: 2017a) LERU recommends that 'EU research programmes should recognise the synergies between research and student education by promoting the development of a strategy for a) transferring research results into teaching and b) enabling students to connect with and learn from research and researchers.' Engagement in research activity helps students to develop important competencies (such as critical enquiry, dealing with uncertainty, fact-based analysis, complex problem solving) and skills (such as time and project management). In addition research itself can benefit from fresh approaches and insights that students bring. FP9 should stimulate academics to teach about their FP9 funded research and promote, wherever appropriate, teaching and professional development, as part of an academic career. LERU also recommends the EC seek synergies between FP9 and the successor of Erasmus +. Two suggestions for these synergies are 1) the introduction of small research experience grants for undergraduate students[2] and 2) additional funding for researchers that want to development a specific tool to facilitate their teaching, or online course on the topic of their FP9 funded research. Education, research and innovation are intrinsically connected as different sides of the same endeavour. LERU recommends the EU treats them that way through its funding schemes and internal organisation.

2 These grants would aim at funding a research experience for an undergraduate student, specifically associated to an FP9 project in which the student's HE institution participates. The NSF's 'Research experiences for undergraduate students (https://www.nsf.gov/crssprgm/reu/) could serve as an example.

2. Principal characteristics of FP9

Excellence

The quality of the research proposed, referred to as 'excellence' should remain the primary priority for FP9 funding. The Framework Programme should continue to fund the very best, stimulating the excellence amongst European researchers and entrepreneurs. An EU-wide climate of competition for excellence has had and continues to have a positive influence on national, regional and institutional reform of R&I policies. This will result in an improved quality of research, research-based education and more effective transfer of knowledge (see also LERU: 2016c). Any deviation from 'excellence first' would quickly harm the reputation and attractiveness of the Framework Programme. LERU is convinced that RRI, and gender equality in particular (see section 11 below and LERU: 2012), positively contribute to excellence in research.

Impact

As mentioned above, universities have real impact on society and the economy. It is increasingly important for universities to demonstrate that impact. LERU recently published a paper on 'Productive interactions: societal impact of academic research in the knowledge society' (LERU 2017b) which analyses universities relationship with societal impact and includes important considerations regarding the impact of research and innovation activities. LERU welcomes the EC's focus on achieving impact with the funding it allocates. It is however crucially important that the EC broadens its views on impact considerably. As mentioned in the LERU paper, impact is a dynamic, open and networked process in a culture of sustained engagement and co-production of knowledge. There is no linear process towards impact. In FP9 the EC should refrain from using scales similar to the current Technology Readiness Levels (TRLs) that are not suited to measure or visualise impact (see also LERU: 2016b).
Connected to this current narrow thinking about impact as something that should directly contribute to 'growth and jobs', is the EC's definition of what 'innovation' is and how it should be achieved. This definition, or view, needs to change in the run up to FP9. Innovation should be considered a process rather than a service or product at a certain point in time. It should also include social and societal innovation, alongside technological or economical.

Trust-based methodology

In February 2011 LERU published a forward looking note (LERU: 2011a) asking the EC to trust beneficiaries more, by establishing a modified 'certificate of methodology' (CoM) for local accounting procedures and accountability rules. The request for an increase of trust has been repeated on many occasions, especially in 'KISS Horizon 2020', LERU's response to the Simplification survey in October 2015 (LERU: 2015c). LERU once again calls upon the EC to investigate this suggestion in the light of preparations for FP9, with the goal of making the next FP the simplest ever.

Referencing the February 2011 note LERU proposed concretely for the EC to establish criteria for beneficiaries to qualify for this 'certificate'

(1) use an analytical accounting system;
(2) are responsible for their financial administration, and
(3) are subject to an external annual audit and approval of the accounts by a private accountant or a public body.

LERU proposes where the accounting system is acceptable and an external audit system is established, the obligation to have a separate accounting system for FP projects should be abolished. To do that, the EC should check and 'certify' the local accounting procedures and accountability rules. Where these minimum requirements are not met, the EC's model for project administration would still be applied. This would motivate organisations to move to a more trustworthy financial administration. The majority of FP grants are awarded to a relative small number of organisations and LERU is convinced that the majority of these are subject to 'certifiable' systems as set out above. A similar certification to the one set out above for accounting practices and accountability rules, should be developed for standards for Responsible Research and Innovation (see section 11 of this paper).

Uncomplicated and transparent rules and regulations

In terms of the simplification agenda, it is essential not to make too many changes when developing the new FP9 rules of participation. There are rules that most certainly need to remain, of which the single reimbursement rate is

the most important. It was the most significant simplification measure introduced in Horizon 2020. It not only simplifies project management for beneficiaries (especially project coordinators) but also the EC. LERU also recommends retaining the 100% reimbursement of direct costs (with a minimum – see below in section 10) and the flat rate for reimbursement of indirect costs of at least 25%. Although the present flat rate of 25% does not cover the actual costs of beneficiaries, for reasons of simplification alone, LERU is not in favour of re-introducing a full cost reimbursement option in FP9.

The implementation of the Horizon 2020 rules of participation has not been particularly smooth. As ever, the devil is in the detail and these caused, in some cases, years of uncertainty for beneficiaries, with a number of issues unresolved after 4 years. LERU believes the EC has the best of intentions, but unfortunately the practicalities of how larger legal entities function is often missed by EC officials. LERU suggests the EC reconsiders the composition of its advisory group for the MGA and AMGA in FP9, ensuring it includes representation from those responsible for preparing financial reports from experienced beneficiaries in different sectors, to act as a sounding board for the EC when drafting rules, introducing changes or making annotations.

Funding through grants, on the basis of costs incurred

LERU would like to restate the importance of FP9 funding being allocated through grants, reimbursed on the basis of costs incurred. The introduction of financial instruments should be limited to close-to-market projects and should be beneficiary appropriate. Universities should always be able to access funds from grants (see also LERU: 2016c).

LERU also emphasises the importance of maintaining a cost-reimbursement funding model for FP9, and warns against a shift towards output-based funding, especially for early-stage, discovery research but also for projects that focus on an intermediate phase of research and development. Offering funding on the basis of what outcomes might be expected, poses a real threat to blue-sky thinking and could lead to 'safer' research. LERU's recommendation is that projects which have objectives to 'explore' an unknown field should by definition not be funded on the basis of a rigid, predefined set of final outcomes. Funding frontier, ground breaking research needs to remain flexible and accommodate unpredicted, new research outcomes. Serendipity discoveries such as antibiotics, microwaves, Teflon and radioactivity, are good advocates for allowing flexibility in the measurement of research outputs (see also LERU: 2016b). LERU could see a potential role for output-based funding for very advanced - close-to-market projects. An output-based funding approach should not become the norm for funding research and innovation activities.

The EC is currently investigating an increased use of lump sum payments in the run up to FP9. LERU understands that using project-based lump sums can be advantageous to simplification as it could decrease or even remove cost reporting and auditing. But there are also serious concerns regarding this approach, which LERU has already raised many years ago (LERU, 2011b). These concerns are 1) that the unpredictability of research means that lump sums would be too inflexible to cope with the type of changes that happen during the course of a project; 2) that sustainability of funding is also an issue, as lump sums tend to fall far short of covering the full cost of an action; 3) the negotiation process would become more, rather than less, onerous – retaining the current time to grant would be impossible; 4) a lot of work would have to be done to ensure that the level of funding was appropriate for the work to be done and what the assessment criteria for the project outputs would be. LERU welcomes the pilot on project-based lump sums in the last years of H2020, will thoroughly analyse it and is looking forward to discussing details of this new approach with the EC. In general, however, and especially for FP9, LERU prefers a trust-based approach as set out above.

3. European Research Council (ERC)

Global context

LERU confirms its strong support for the European Research Council. Shortly after it was set up in 2007, the ERC became a beacon for international, excellent, frontier research. Receiving an ERC grant is a huge stimulus to a researcher's career. It opens doors to permanent positions, to positions at other strong universities, or attracts top researchers from third countries to Europe. The Europe-wide competition generated by the ERC, with its continuously improving high quality evaluation system, has put Europe on the global map. The ERC has raised the level and ambition of European research and researchers. The fact that the EU surpassed the US for the first time in the 1% highest cited scientific publications is a major achievement and probably, at least partly, the consequence of the high quality publications from ERC grantees: 7% of the total reported publications by ERC grantees is among top 1% most highly cited publications in the Scopus database[3]. Each ERC grantee employs on average six team members, contributing to training a new generation of excellent researchers[4]. The ERC plays a crucial role in the EU's attractiveness to highly skilled human capital, and is therefore directly influencing the EU's competitiveness. LERU is in no doubt that the ERC should be a cornerstone of FP9, as it was for Horizon 2020, and that it should continue to support excellent, frontier research as it has done over the past 10 years.

The funding of blue-sky, frontier research must be maintained especially as in recent years funding has become more geared towards close-to-market research. A qualitative study of ERC funded projects showed that "close to 50% of projects already had some apparent impact on the economy and society, and nearly 10% had a major impact to date, which underlines the importance of the ERC approach of giving researchers the freedom to undertake curiosity-driven frontier research. Without having societal impact in mind initially, this bottom-up approach delivers in this respect." (ERC: 2016) The success of the ERC Proof of Concept (PoC) scheme also shows that in order to stimulate innovation, funding not only needs to focus on close-to-market activities. On the contrary, truly innovative ideas are more likely to originate from blue-sky, frontier research than from pre-determined approaches.

ERC and FP9

LERU is not in favour of the ERC moving out of the EU Research and Innovation Framework Programme (FP) or of it becoming an international foundation. The current position of the ERC within the FP, but with a large degree of autonomy from the EC, should be maintained in FP9. Especially the autonomy of the ERC to fund the best researchers, without pressure from Member States or other funders wanting to get back what they put in or intervening in the grant selection or management process, would be at risk if the ERC were to move outside the FP. LERU requests the EC to guarantee the ERC's autonomy in FP9, also regarding grant management. LERU supports the ERC Scientific Council's request for retaining the Horizon 2020 legal provisions in this regard (ERC: 2017).

ERC funding schemes

In FP9, LERU would like the ERC to maintain its four main funding schemes, namely Starting, Consolidator and Advanced grants and the Proof of Concept. The Starting, Consolidator and Advanced grants stimulate the best researchers to develop cutting-edge research proposals, competing at European level with the best of their peers. Receiving an ERC grant is a stimulus to young researchers' careers by motivating the rising stars of European research to stay involved in research and to lay the foundation of the discoveries of tomorrow (starting and consolidator), and it triggers mobility within and to the EU. An ERC grant stimulates researchers to use their expertise to develop new research questions, to carry out high-risk research projects with more freedom and longer periods of funding compared to national funding schemes. At the same time an ERC grant allows a Principal Investigator to develop a team of highly skilled, motivated researchers, often PhD students and post-docs, to work with him/her in these remarkable circumstances and so contributes to the training of the next generation of top researchers. LERU underlines that all three individual grants make a specific and important contribution to the European research landscape. The international competition for excellence and the focus on frontier research makes the ERC a globally esteemed and attractive research funding programme.

3 Value as of June 2016 referred to the entire pool of ERC publications from all sources: reported publications, Elsevier Scopus database, OpenAIRE database.

4 https://erc.europa.eu/projects-figures/facts-and-figures

The Proof of Concept scheme is an important add-on to the three individual grants. With more than 387 proof of concept grants already awarded, the scheme works well and is an excellent example of follow-up funding, a concept LERU recommends be introduced for collaborative research (see below). The ERC Proof of Concept scheme should certainly be continued in FP9.

As for Synergy grants, LERU is aware of the extensive 2014 evaluation of the Synergy grants, but feels it was too early to evaluate the scheme as it only run as a pilot (with two calls) between 2012 and 2013. LERU finds it therefore difficult to make recommendations regarding Synergy grants at this moment and is looking forward to the results and analysis of the new Synergy grants that will awarded in the last years of Horizon 2020.

LERU strongly emphasises that Synergy grants cannot replace frontier collaborative research activities as these should be funded through FP9's collaborative research and innovation programme (see below). Synergy grants should continue to fund the bedrock of new interdisciplinary, scientific approaches and disciplines. It will never fund the same type of activities as frontier, collaborative research in other parts of FP9.

ERC budget

The ERC has an excellent international reputation, has become a fundamental part of the European research landscape and has proven repeatedly that ERC funded research leads to high level outcomes and has a wide impact. To continue along this path, to avoid any further drop in success rates and to be able to develop new insights and ideas in the future, a substantial increase of the current ERC budget is needed and would be welcomed.

ERC and widening participation

Widening participation is addressed in detail in the section 10 of this paper. It is, however, important to emphasise also here that the ERC should continue to award funding solely on the basis of the excellence of the scientific work proposed. There should be no attempt to introduce geographical criteria. For institutions in regions with researchers less successful in ERC, the ERC's high standards are considered important targets. Striving for an increased success in applying for ERC grants is a strong incentive for implementing change and for modernisation of the research landscape. There is a number of ways in which Member States or institutions can seek to improve participation in ERC: through the development of specific schemes to enhance greater engagement with the ERC, through funding researchers that have received 'an ERC seal of excellence' or by participating in the ERC Fellowships visiting programme[5], which should certainly be continued and expanded in FP9. European Structural and Investment Funds (ESIF) should be available to support these initiatives (see below).

Practical concerns and considerations

LERU encourages the ERC Scientific Council and Executive Agency to assess and evaluate the shift of focus in recent years from the scientific work to the administrative management of grants. Principal Investigators (PIs) are increasingly burdened by requests regarding administrative, financial and ethical aspects of their research. Although LERU appreciates the need to control the implementation of ERC grants and ethical issues, this should not be given priority over the project work. The burden to PIs needs to be minimised and the flexibility promised must return. As LERU has already proposed for FP9 in general, the ERC Executive Agency (ERC EA) should much wider accept national and/or institutional practices (see above under 'trust-based methodology), limiting the administrative burden for researchers.

Evaluation

LERU is aware the ERC Scientific Council investigates how best to deal with interdisciplinary research. LERU would welcome a different approach to evaluating interdisciplinary projects in the future[6]. Alongside this the Scientific Council should also look into ways of addressing the often large range of (sub) disciplines currently covered by one panel.

LERU will continue to strongly support the ERC in FP9 and offers its support to the ERC Scientific Council and ERCEA to ensuring it maintains its important position in funding the best research.

5 https://erc.europa.eu/sites/default/files/press_release/files/ERC_Visiting_Fellowship_Programmes.pdf

6 LERU proposes several avenues to strengthen evaluation of interdisciplinary research in its paper 'Interdisciplinarity and the 21st century research-intensive university' (LERU: 2016e).

4. Marie Skłodowska-Curie actions

Over the past 20 years Marie Skłodowska-Curie Actions (MSCA) has become the hallmark of qualitative education of young researchers. MSCA equips young researchers with the knowledge, skills and international and cross-sectoral exposure to fill the top research positions of tomorrow, both inside and outside academia. The Actions have delivered an army of almost 100,000 talented and highly-skilled people who entered the labour market, working in businesses, governments, research institutes and universities.

The structural effects that MSCA has had on the European Research Area should not be underestimated: (1) mainstreaming European academia of up-scaled research-related and transferable skills training systems, leading to better career prospects for PhD students and postdocs in general; (2) by embedding the European Charter and Code for Researchers in its own programmes, the MSCA schemes have enhanced the uptake of open and transparent recruitment and appointment procedures for young scientists in Europe; (3) MSCA has contributed to the introduction of Responsible Research and Innovation elements, such as gender, public engagement and outreach, and pushed this mainstreaming across Europe; (4) finally, and possibly most importantly, the competition for excellence, by awarding the most promising young researchers a MSCA Fellowship or by selecting the best Training Networks for high quality training of PhD fellows, has resulted in a quality label for the individual fellow's CV, but has also encouraged institutions to reform and/or enhance their own systems.

LERU calls upon the European institutions to cherish MSCA, to retain MSCA as a core programme of FP9, and to invest much more in it. Continuity is key in this respect. LERU does also have a few suggestions for changes and improvements. Given its impact on research and innovation, on the R&I community in Europe in general, the European Research Area, and therefore its critical role in FP9, LERU recommends the portfolio of the Research Commissioner and Directorate-General is extended to include MSCA, alongside the rest of the Framework Programme.

The low success rates indicate a high interest in the MSCA. More budget is urgently needed to cope with the high demand, especially for Initial Training Networks (ITNs). At the same time, the EC should look into options of managing demand better. The EC should also not hesitate to rationalise the various Actions, increasing focus on the highly successful schemes that form its core such as, the Individual Fellowships and ITNs, and reducing investment in the others.

LERU would like to restate again the importance of the competition for excellence and asks that the EC refrains from introducing measures in MSCA that move away from that. The dilution of the MSCA quality label and its structuring effect are at risk should measures be introduced to establish separate pots of money to perceived underrepresented groups such as SMEs or widening countries. Separate 'pots' would create two levels of excellence which should be avoided by all means. As mentioned in section 10 of this paper on widening participation, the competition for excellence is an important stimulus to trigger reform. At the same time the very best researchers would quickly lose interest in the MSCA and the Actions would lose its prestige if the competition for excellence is compromised. This does not mean that MSCA cannot contribute to widening participation. LERU proposes concrete suggestions for synergies between MSCA and the ESIF in section 10.

Marie Skłodowska-Curie Actions should remain vigilant when selecting successful projects: the programme will only retain its prestigious quality label if its evaluation system is robust and is demonstrably harvesting excellence. In section 6 (below) detailed suggestions on evaluation are made.

MSCA has introduced many successful simplification measures, not least the length of the application form. LERU calls upon the MSCA policy and implementation units to move further in this regard, and avoid adding additional 'red tape' by moving back to basics with the following evaluation criteria (1) science and training, (2) impact and dissemination, 3) technical implementation, reducing all other requirements to the absolute minimum.

5. Collaborative research and innovation programme

Introduction

Funding collaborative research through the R&I Framework Programme has a clear EU-added value. It brings partners from different European countries together to develop projects and implement them, under the same conditions and with the same goals and deliverables. It stimulates cross-sectoral partnerships and it stimulates the focus of research from different disciplines on addressing societal and industrial challenges. There is no other funding mechanism, at least at Member State level, that can fund collaborative research and innovation activities on the same scale. LERU advocates for collaborative research and innovation to be an integral part of FP9 and to receive sufficient funding to implement its ambitions.

LERU recommends the bringing together of all collaborative research and innovation activities funded through FP9 into one large research and innovation programme. LERU is convinced this approach will discourage the formation of research 'silos', and will stimulate new ideas to better tackle challenges from different perspectives (societal and industrial). This collaborative R&I programme should have the same characteristics as collaborative research in Horizon 2020: international, cross-sectoral, interdisciplinary and aimed towards addressing societal and industrial challenges. It should also continue to stimulate innovation but LERU proposes this should be done differently to Horizon 2020. To allow for new ideas or 'disruptive innovation', the focus of the programme should be on funding the entire process of knowledge production and innovation, not only the end of that process as is now predominantly the case (see also LERU: 2016b).

The organisation and development of challenges, topics and calls should also be very different in FP9. Here LERU suggests a refreshed approach, with a mixture of calls aiming at quick wins and incremental innovation and of broad topics and open calls. The latter are needed to generate new ideas or disruptive innovation, to achieve impact also in the longer term. These broad topics should result from a bottom-up consultation process.

The collaborative R&I programme should be designed around major themes or societal-industrial challenges. Instead of reinventing the wheel, LERU proposes the EC aligns its collaborative programme along the UN sustainable development (SD) goals[7]. These goals are global, and are all therefore very relevant to Europe. The spread of funding over the different goals should differ, depending on the direct relevance of the goals for the EU, which are to support its citizens but also to contribute to global development.

LERU wishes to reiterate the importance of continuing the funding of smaller and medium-sized consortia, next to larger-sized consortia or flagships. Experience shows that small and medium-sized consortia are more flexible in their approach, lead to longer lasting collaborations between the different partners involved and hence lead to greater impact. The EC's Directorate-General for Research and Innovation should be able to continue to support these smaller projects, and not be pushed towards lesser and bigger projects solely for practical or economic reasons. There should not be a further increase of the current focus on big consortia or flagships, nor of the so called 'cascade funding' approach, aimed at large entities that perform R&I and launch calls themselves. The only exception to this should be the development of a flagship that focuses on the future of democracy and the welfare state in Europe, similar to the flagship proposed by LERU in 2013, on 'A resilient and Dynamic Europe in a Globalised world' (LERU: 2013a pg. 49-55), given the importance of the topic to Europe and the current lack of larger scale funding for it.

The collaborative research and innovation programme – The proposal

Bottom-up

LERU very much supports the **Future and Emerging Technologies (FET) programme** in Horizon 2020, especially FET open and FET proactive. These schemes fund bottom-up, bright ideas in collaborative setting which are missing in the Horizon 2020 Industrial Leadership and Societal Challenges' pillars. For FP9's collaborative programme, LERU proposes

7 http://www.un.org/sustainabledevelopment/sustainable-development-goals/

a bottom-up approach, with broad, open calls in all SD goals, implementing the much appreciated characteristics of FET open and FET proactive in the whole collaborative R&I programme.

Within each SD goal, call topics should be based on an open **consultation process**, calling for ideas. This process should include a public conference as well as online input, with at least 3 months to respond. The consultation process should be advertised well in advance and awareness of it should be actively raised within the EU's scientific and business community, as well as with citizens. The consultation should aim at collecting broad topics, which are clearly aligned to a SD goal and aim at an interdisciplinary and/or cross-sectoral approach. Keeping the topics broad is important to allow for sufficient scientific flexibility and creativity in project applications,

The ideas resulting from the consultation process would then be discussed by **expert groups** (one per SD goal), which are newly established for FP9 and include researchers, business people and policy makers. It is important that each expert group has a good representation of researchers from different disciplines, certainly including the Social Sciences and Humanities. The expert groups should have a clear list of evaluation/assessment criteria to create the final list of topics. Among these criteria should be the broadness of the topic, but also strategic or societal relevance, structural sustainability, integration of international scientific cooperation and long-term outlook. Electronic clustering tools can be used to group similar topics and so assist the experts in deciding on the final topics. To allow maximum transparency, all topic proposals resulting from the online consultation should be published online, including the summary of the decisions made by the expert group on why some topics were selected and why some were not. The consultation process should be repeated every two years, ensuring new research developments are captured and FP9 continues to evolve. The first consultation process should be organised by the first half of 2020 at the latest, to avoid a funding gap between Horizon 2020 and FP9. The expert group should be selected at the same time to avoid the problems faced in Horizon 2020 on the timing of appointing members for the various advisory groups.

The **broad topics**, resulting from the consultation process and selected by the experts, **should be transformed into calls for proposals, without downsizing the topic**. Each call for proposals should be open simultaneously to applications for projects at different stages of the research and innovation process: Early - frontier research; Medium - 'focused' research; and Advanced - close-to-market research activities[8]. LERU suggests these to be defined as 'research actions', 'research and innovation actions' and 'innovation actions'. The outcome of each call for proposals is therefore a set of projects, focusing on different stages of the R&I process (see also LERU: 2016c).

An example of the proposed new process:

Topic 1: "beating major diseases". One call would harvest three types of projects at different levels in the R&I process:

- Understanding disease and discovering targets for beating disease (research action)
- Translating targets into functional drugs treating disease (research& Innovation action)
- Transferring knowledge into markets, beating disease (innovation action)

Topic 2: electricity storage…

Topic 3: dealing with radicalisation, a European solution…

From a single call for proposals, applicants should select the most appropriate instrument for their project. Industry partners or Member States could at the same time contribute by co-sponsoring certain topics, resulting in a new type of instrument (see section 9). Evaluators should be well briefed to ensure calls result in a wide variety of excellent projects.

Every call for proposals should be open for two years, with two cut-off dates per year. This will go some way to reducing excessive oversubscription and is likely to increase the quality of the applications, as applicants will have more time to look for the best partners. To enable the uptake of research results in new projects, bottom-up calls should be made in a predictable and recurrent way.

Top-down

Alongside these open, bottom-up calls, there should also

8 LERU already proposed this in its Interim Evaluation paper, to be implemented for the challenge-based, broad topics in Horizon 2020 (see LERU: 2016c).

be calls to address emerging issues or to complement the bottom-up topics. These calls should be decided in a top-down manner, with strictly defined topics and clear expected impacts. The EC should decide on these top-down calls, but could seek input from the expert group which selected the bottom-up topics who could make suggestions for top-down topics at the same time as deciding on the bottom-up ones, and from experts more aligned to specific needs of society or the market.

Funding

Although LERU considers both approaches to be important, the largest amount of funding should be allocated to the bottom-up calls as these are also likely to generate more applications and to result in new ideas, and real disruptive innovation, in both the short and especially the long term.
LERU also proposes that a small part of the funding allocated to each SD goals (e.g. 10%) should be flexible, to move from a goal that generates fewer high quality applications to another goal that does generate many excellent proposals.

Clustering

A requirement for each project should be joining a cluster of related projects, to exchange information, for instance at an annual conference and at a common website to showcase their research. The European Commission project officers would play an important role in overseeing and facilitating this activity, providing also practical support. The costs related to clustering activities should be eligible with minimum allocations to each project. Clustering should not lead to additional red tape, but should generate an exciting opportunity for knowledge exchange leading to an increased impact of the research particularly to business and the wider public and which may lead to new project ideas emerging. The additional benefit is to avoid overlap in activities within projects. This system of clustering worked well in ICT projects in FP6 and should be re-introduced.

Programme Committees

LERU sees an important role for Programme Committees in FP9, namely to control the process of topic identification, both top-down and bottom-up, ensuring it is democratic and fully transparent. The Programme Committees should, however, not intervene on the topics selected, but focus on the process itself.

Follow-up funding

As already mentioned in the LERU H2020 Interim Evaluation paper (LERU: 2016c), LERU proposes the EC introduces the possibility in FP9 to apply for follow-up funding for collaborative research & innovation projects. This 'follow-up' funding should be limited to a short-term type of proof of concept scheme, similar to the current PoC scheme in ERC, FET Launchpad or Fast Track to Innovation, leveraging project outputs to close-to-market activities. Given calls would be recurrent, there is already a possibility for 'less-advanced' results to be taken further in new projects. The follow-up funding scheme should only be available to those projects that need little extra budget and time to test the project's outcome in terms of market potential or impact on society. This would include ideas which are at a very early stage of business development requiring additional support. Currently little support is available in Europe for that risky phase of business development. Although this is high risk funding, LERU firmly believes making this type of funding available, where relevant with co-funding from private investors, will reduce the "valley of death" which has been a concern for decades.

Interdisciplinary and cross-sectoral

LERU supports the continuation of interdisciplinary and cross-sectoral collaborative research and innovation established in Horizon 2020. However, according to the 2015 monitoring report, the integration of perspectives from Social Sciences and Humanities (SSH) in most societal challenges in Horizon 2020 is still unsatisfactory[9]. This should be dealt with differently in the remainder of Horizon 2020 (see LERU: 2016c, but also LERU: 2013a for concrete suggestions on SSH's contribution to societal challenges).

LERU is convinced that the proposed broad topic, bottom-up approach in the framework of the UN sustainable development goals (as set out above) will facilitate cross-disciplinary research collaborations and avoid problems regarding SSH participation in FP9. LERU, however, asks the EC to remain vigilant, to continue to monitor SSH participation and to guarantee the engagement of SSH researchers in the expert groups (see above). It will also be up to the SSH researchers to find their way to the Framework Programme and to engage with other disciplines and partners from other sectors to create strong, joint proposals.

9 https://bookshop.europa.eu/en/integration-of-social-sciences-and-humanities-in-horizon-2020-pbKI0116934/

LERU wishes, however, to reiterate that all SD goals would and should benefit from contributions of Social Sciences and Humanities research. In general, interdisciplinary projects should be the core of collaborative research in the next Framework Programme and interdisciplinarity must be part of the evaluation criteria.

LERU also wishes FP9 to continue to support the inclusion of business, be they SMEs or larger companies, as well as societal actors to work alongside researchers from academia and research organisations in consortia. A variety of partners has the potential to stimulate projects at all stages of the R&I process.

International

The mandatory collaboration between partners from different EU Member States (and associated countries) is an incredible strength of the EU R&I Framework Programmes. This should, without any doubt, be maintained in the future, but not steered in specific directions. LERU is pleased with the current eligibility criteria regarding the number of partners from different Member States in a consortium. This rule should also be applicable in FP9.

LERU welcomes the EC's considerations for changing the criteria for countries to be allowed to associate to the Framework Programme. It is important that association to FP9 is limited to countries of strategic importance to the EU's research and innovation landscape. From that perspective, LERU underlines that UK universities, regardless Brexit, should be able to participate in FP9 as they are an undeniably strong part of the European Research Area.

Many challenges society and industry are facing are not Europe specific, requiring collaboration with the rest of the world. Stimulating third country participation is important and aligning the FP9 collaborative research and innovation programme with the UN sustainable development goals could help attract these partners. Increasing the funding opportunities for early stage-collaborative research and innovation will also stimulate the involvement of third countries.

Except in cases of specific strategic relevance, the accessibility to funding for research should be reciprocal. A good example is the H2020 Health societal challenge which is accessible to US researchers whilst NIH calls are open to researchers from the EU. This reciprocal openness also has a strategic advantage, ensuring access for European partners to specific talents or infrastructures in third countries.

Concerning the rules of participation, LERU suggests the re-introduction of the included 'joint' calls where applicants from third countries applied to their national funder in parallel to the European consortium. Although this approach had its flaws, there was certain logic to the process. In general FP9 rules should stimulate the participation of third countries, not hamper it. Changes recently implemented by the EC to remove the obligation of third countries to sign the grant agreement if they are not directly funded by the EU are very helpful in this respect and should be maintained in FP9. The EC should also continue the flagging of topics that are particularly suitable for international cooperation in FP9, as it currently does in Horizon 2020.

LERU wishes to underline that the inclusion of third countries in 'normal' collaborative R&I project should be stimulated in FP9. The EC should certainly not only focus on including third countries in large, international projects.

6. Evaluation

Interdisciplinary and cross-sectoral research and innovation needs to be evaluated by a high quality and wide range of experts from different backgrounds (see also LERU: 2016d). As mentioned in its H2020 Interim Evaluation paper (LERU: 2016c), LERU proposes standing panels should be created. The 15-20 members of these panels should come from different disciplines and have among them complementary expertise in business and societal (e.g. diversity) issues. A spread of nationality and gender should also be taken into account. The panels should rotate, for instance every two years. Formal appointment procedures for these selected experts should be in place, guaranteeing their quality and expertise.

Collaborative projects that are evaluated in single-stage should be reviewed by relevant members of the standing panel (2 to 3), in combination with remote reviewers (4 to 6). Their combined review would be submitted to the entire standing panel to discuss the reviews and to decide on the final score. In case of a two stage evaluation, stage one applications should only be evaluated remotely. The second stage evaluation should be similar to the one set out above for single-stage evaluations.

MSCA currently utilises a purely remote review process. LERU asks that this new approach is thoroughly assessed to ensure the quality of evaluations is maintained. The technology behind remote refereeing should not hamper discussion between the experts to reach proper consensus, nor should the system lead to compromises regarding the selection of quality. Evaluators must have the opportunity to fully discuss proposals. To ensure experts understand each other truly, comments should not only be discussed in writing, but also in person. If a physical meeting is not feasible, at least a virtual one – with mandatory video conferencing – should be set up. However, LERU remains in favour of continuing as much as possible face to face consensus meetings, which are a critical part of the evaluation process.

To help the evaluators, applicants to calls of the Collaborative R&I programme should be asked to elaborate on the EU-added value, as well as a number of other important aspects of their projects[10]. The requested impact statement should be fairly narrow where applicants are asked for 1) the specific impact expected within the projects lifetime; 2) the possible long-term impact. However, it is without any doubt that the scientific quality (excellence) of the research proposed should remain the first and most important selection criterion for the research and innovation programme in FP9.
The above suggestions aim at improving the evaluation system but LERU considers it even more important that the EC ensures better training of evaluators and provides detailed briefings on the expectations of the evaluation. Part of this briefing should highlight the importance of maintaining an open mind, and to fund a variety of projects to allow for better synergies amongst and diversity of projects. Training and briefing should also include raising awareness about implicit bias (gender and other types of bias) and strategies to prevent it.

Another crucial point for FP9 is that better and more detailed feedback should be given to applicants than is currently the case in Horizon 2020. LERU is in favour of sharing the complete review of projects with applicants. The EC should also continue to monitor the evaluations and ensure the continuity and consistency of the different panels.

10 Some suggestions of aspects that should be taken into account are: Scientific research potential existing within the EU and/or to be established in the EU; Scientific quality of the overall research plan; Contextualisation in global context (is the topic already covered nationally, internationally); Stimulation of interdisciplinary; Potential new research approach / methods; Knowledge and technology transfer; Impact on education and career (of women)

7. Innovation instruments and the European Innovation Council (EIC)

To enable Europe to develop its full innovation potential, a stimulating innovation ecosystem requires adequate framework conditions in place. Competition policy, the regulatory framework, standards and intellectual property rights are key in this process, but also the availability of adequate **financial support**. The EU funding programmes, such as FP9, together with state aid, tax policy, public procurement and venture capital, play a crucial role in setting these **framework conditions**.

FP9 should be a Framework Programme which funds research and stimulates innovation. Although the focus of the actual funding should be on research and combined research and innovation activities, FP9 should also encompass a limited set of instruments that stimulate and fund innovation actions, as set out in the section 5 on the Collaborative R&I programme. **LERU is convinced of the need for an EU systemic approach on innovation**. EU investment in innovation is strong but complex and confusing, with too many disjointed initiatives. Better coordination of the multiple EU investments in innovation is required. The existing institutions and entities should redefine their strategic and operational frameworks and redraw the boundary conditions under which they function so as to foster optimisation and simplification. LERU does not believe this to be the task of a Framework Programme. FP9 must focus on facilitating and funding science-based innovation and supporting the resulted innovations using the tools outlined earlier and below, to improve conditions for innovative ventures at all stages of the entrepreneurial life cycle.

LERU set out its ideas on the European Innovation Council (EIC) in April 2016 (LERU: 2016a) and the focus and functioning of the EIC in FP9 should be very much in line with these ideas. **The EIC should have a role as an advisor, a catalyst and a coordinator**, with a clear mission to broaden the perception of innovation (see above, section 2). In order to operate effectively, the EIC should be an agile instrument on the European policy scene, conceived as a council of high level people from the business, venture capital and finance, and academic sectors, focusing on these three interrelated innovation issues: policy design, innovation funding and policy coordination. LERU is very disappointed to see no academic, university-based innovation manager among the members of the EIC, announced in January 2017[11]. The EC must recognise the important enabling role universities play in the innovation process, and in developing innovation policy (see introduction and LERU: 2010) by including at least one academic innovation expert within the EIC as soon as possible.

The EIC's primary role should be that of a high level advisory council which advises the Commissioner responsible for R&I but also the entire European Commission on innovation policy, that acts as a catalyst to remedy structural innovation funding and infrastructure gaps and that advises the EC Vice-President for innovation to coordinate innovation policy across EU institutions. In FP9 the EIC should also have the task of advising the EC on the development, use and efficiency of the EC's innovation instruments. The streamlining and optimising of these instruments should be one of the key responsibilities of the EIC.

The first innovation instrument that should be developed under FP9 is the follow-up funding in the Collaborative research and innovation programme. This follow-up funding should be a proof of concept type of funding, only available for projects previously funded by FP9 and its predecessor, Horizon 2020. More information on the concept of follow-up funding can be found in section 5 of this paper.

A second programme which LERU considers being an important innovation instrument is the European Institute of Innovation and Technology (EIT). LERU's views on the EIT in FP9 are set out more in section 8. It is important to emphasise here that, although the EIT should be one of the EC's innovation instruments and as such be part of the portfolio on which the EIC advises the EC, it should maintain its independence. The EIT governing board can take into account recommendations made by the EIC, but it should not be obliged nor pressured to follow these.

LERU underlines that the EIC should be involved in deciding on innovation instruments to be continued or developed, but next to the two instruments mentioned above, LERU would be in favour of continuing the current Horizon 2020 schemes 'innovation in SMEs' and 'access to risk finance'

11 https://t.co/geVO28BAWB

8. The European Institute of Innovation and Technology (EIT)

Also in the next budgetary cycle, the EIT should continue to be part of the Research and Innovation Framework Programme, with the necessary degree of autonomy from the European Commission. Despite this autonomy, LERU considers it important that the EIT is included within the portfolio of the next EU Commissioner for Research and Innovation, notwithstanding the importance of the EIT's remit in education.

In FP9, the EIT should continue to play the highly necessary role it currently has in the European innovation landscape, promoting and strengthening synergies and cooperation among businesses, education institutions and research organisations and creating favourable environments for creative thought, to enable world-class innovation and entrepreneurship to thrive in Europe and to stimulate business creation. The EIT's role and mission should not be diluted amongst the myriad of innovation instruments of the EC. LERU emphasises, however, that the autonomy of the EIT should be maintained and further guaranteed, in relation to other EU institutions and EC innovation instruments like the EIC.

Although the EIT Governing Board has already taken steps to improve the EIT's functioning, some areas related to the EIT's governance and organisation need to be revised as the 2016 European Court of Auditors report[12] highlighted. The concept of 'financial sustainability' requires further clarification and elaboration. The ongoing EIT Mid-Term Evaluation and the upcoming EIT Strategic innovation Agenda (2021-2027) present a good opportunity for continuing the EIT reform. LERU has expressed its vision on the future of the EIT within the Horizon 2020 legal framework in its response to the EIT Interim Evaluation consultation (LERU: 2016d) through 12 insights and considerations, which in short are:

1) The "identity" of the EIT should be one of an institute co-funding the transformation and translation of research insights and outcomes of market, education and societal value.
2) Although full financial autonomy is presently neither achievable nor desirable for the EIT, a decrease in EIT funding to the Knowledge and Innovation Communities (KICs) could operate through a decrease in funding for KIC added-value activities (KAVA) from (up to) 100% to (up to) 75% or somewhat less.
3) The strategic objectives of the KICs have to be aligned with those of the EIT, acting as a whole to set strategy and chart directions in a continuous and interactive process. Better interactional EIT-KIC governance should focus on ensuring that a high-risk/high-gain mentality and disruptive innovation ambitions are valued throughout.
4) The lessons learned on major desirable organisational breakthroughs should be adopted and implemented at higher speed.
5) A less ambiguous positioning of the EIT at the level of the EC is strongly advocated, in which for example the regulatory framework and KIC complementary activities are critically reviewed.
6) The EIT Governing Board should inform the KICs of the available funding envelope and be more transparent about how funding to each KIC is decided.
7) The major decision processes on and within the EIT need to be redesigned.
8) Cross-KIC collaboration opportunities should only be encourgaed where there is a clear added value.
9) Shaping and designing the next stage of the EIT lifecycle should directly and intensively involve the six existing KICs.
10) Designing EIT quality labels should be done together with the KIC partners.
11) The EIT should clarify its role in sharing, designing and implementing best practices.
12) DG EAC and the EIT should cooperate to identify the relevant Key Performance Indicators.

These twelve recommendations were made in light of the interim evaluation of the EIT but are also very relevant for the EIT in in FP9. More detail on these points can be found in the LERU response to the consultation.

The current EIT KICs, Climate, Digital, InnoEnergy, Health, Food and Raw Materials already cover a broad range of activities that address important challenges for Europe. And possibly two other KICs, on urban mobility and manufacturing, could be developed in the last years of Horizon 2020. Therefore, in FP9 the EIT should focus on the continuation of its reform, the consolidation of its role as transformation and translation agent, and the supporting of the activities of the existing KICs. The possible setting up of a (few) new KIC(s) should certainly not be a priority and should only be considered if analysis and consultation point to an important need for a new KIC in a specific area.

12 http://www.eca.europa.eu/Lists/ECADocuments/SR16_04/SR_EIT_EN.pdf

9. Joint Initiatives – Public and private engagement in FP9

LERU recognises the importance of a collaborative public and private approach to certain research activities and proposes an alternative model for FP9 which will greatly simplify what is currently an extremely complex structure. Rather than externalising these partnerships, including public and private engagements, LERU proposes this should be facilitated within the Collaborative research and innovation programme itself. Currently, the EC invests parts of the Horizon 2020 budget for collaborations with industry and clusters of Members States via Public-Private Partnerships or Public-Public Partnerships (PPPs). To a certain extent this has been successful: Horizon 2020 does indeed leverage funding and collaboration at a higher level, and appears to generate a less fragmented approach towards R&I for grand challenges. However, the consequence of the current approach is a complex model with multiple externalised agencies and entities, each with its own structures, overheads, procedures for call topic design and selection process for the projects. Beneficiaries are left overwhelmed with complex funding streams which are far from transparent and tend to be more favourable to larger industry partners. The result is an unnecessarily wide range of instruments, all of which goes against the principles of transparency and simplification, as well as ring-fencing budgets.

To retain the important leveraging and structuring effect and to avoid similar problems in FP9, LERU proposes to reverse the externalisation of these partnerships, and especially the budgets, into a process of 'internalisation, focusing on co-funding'. Using this approach industry, as well as Member States, would jointly decide, alongside the EC, their priorities for societal or industrial challenges (within the UN SD goals) by co-investing in the FP9 Collaborative research and innovation programme. The bigger co-funded projects, aimed at structuring the research on a specific topic are best selected through specific top-down calls. However, it should also be possible for co-funding to be allocated to calls resulting from a bottom-up approach.

The advantage of this co-funding process is that it would lead to a uniform landscape where the same rules, procedures and evaluation process are used. Obviously this internalisation would require the co-funding entities accepting a loss of control, but LERU is convinced that the clarity and efficiency Europe's scientific and innovation communities will gain, makes this a win-win situation, removing the unnecessary additional overheads and separate procedures the current arrangements have, as well as making such collaborations much more transparent.

Co-investment by national funders could use at a similar approach to the current ERA-NETs. National entities or funding agencies would decide whether to co-fund a call for proposals launched by the EC. For instance, for a broad collaborative R&I call on beating Alzheimer's disease, 90% of the available budget would be allocated to 'normal' projects. The remaining 10% could be matched by funding from different national funding agencies. In section 10 below, it is set out how Member States should be able to use European Structural and Investment Funds for this purpose.

Co-investment from industry could use a similar approach to the one taken by the Innovative Medicines Initiative (IMI), where the private sector or large industries decide ex ante to co-invest in certain challenges or goals (as proposed in section 5) and sponsor projects in certain topics (which are set top-down). In return, a small amount of the entities' autonomy would be conceded to the level of the European Framework.

A decent but limited number of topics should be open for co-investment by public and private actors, to keep the process clear, transparent and manageable. Funding for these topics should not only be available through the co-investment approach. Also 'normal' FP funding should be available to fund projects within these topics, to ensure that there is funding, within one topic, for all stages of the research and innovation process, including frontier research.

10. Widening participation

The participation rate in Horizon 2020 projects shows an uneven spread amongst EU Member States and other participating countries. It is, however, no longer a simple pattern of 'old' Member States doing well and newer Member States doing badly. On the contrary, a number of newer Member States are doing quite well while some older Member States' participation has decreased considerably. On the one hand it is normal that there cannot be 'excellence hubs' everywhere in Europe, and especially that not every region within one Member State can perform to the same extent. On the other hand nothing should prevent excellence from thriving where it is present. For institutions in less-performing regions, the call for excellence in Horizon 2020 and the goal of increasing participation is a stimulus to improving their performance and to reform internally. At the same time this causes frustration, especially where other factors, out of their own scope and competence, are impeding them to do better. Many barriers to Horizon 2020 participation, such as organisational structure of universities, the promotion process of academic staff and remuneration systems, require reforms at national, rather than institutional level. LERU calls upon the Member States in the EU to enhance and support the modernisation of their academic systems, to give institutions autonomy, including on the remuneration of their staff. At the same time, LERU calls upon the EC to stimulate these reforms as strongly as it can by incentivising the use of European Structural and Investment Funds (ESIF) for R&I favourable reforms, especially where there are relevant country specific recommendations.

The specific aim of ESIF is to stimulate and fund regional growth and cohesion. This cannot and should not be a goal of the EU Framework Programme for Research and Innovation. Excellence and competitiveness should remain the underlying principles of FP9. Any criteria or quotas in the new Framework Programme which aim to influence geographic distribution or cohesion should be opposed. It would counter the stimulus of the competition for excellence and it would result in 'token partners' in consortia. LERU wishes to underline that geographical eligibility criteria should also not be used to favour stronger regions or institutions. Consortia should be evaluated on the basis of the quality of their proposal alone. No project should be turned down because it does not include partners from better-known institutions or from a specific region.
LERU is aware of the perception of closed networks between more established researchers and institutions, not including excellent partners from less-established regions. It is, nevertheless, important to tackle the root of the problem; established researchers may not know excellent researchers from less-preforming regions. These researchers should be offered the opportunity to establish their name in an international environment, to make their research better known across Europe. LERU is very supportive of the many commendable initiatives individual organisations take in this regard. The ERC visiting fellowships programme[13] and the KU Leuven CELSA initiative[14] are just two worth mentioning. LERU recommends the EC look into other ways of supporting this work in the future.

Synergies between ESIF and FP9

Taking into account the divergences in aims and focus between the Framework Programme and the ESIF (as set out above), efforts must be made to maximise synergies at programme level. LERU has a number of suggestions on how to realise this. However, for this to be achievable there should be a specific percentage of ESIF earmarked for synergies with FP9. This earmarking should be inherent and not optional in ESIF post 2020 for each Member State. This earmarked funding should also be exempt from state aid rules.

As a first proposal for synergies between ESIF and FP9, LERU suggests continuing the Seal of Excellence as was developed by the EC during Horizon 2020. Currently this "Seal" exists for the SME instrument, ERC grants and Marie Skłodowska Curie Fellowships, but is insufficiently applied. LERU suggests the EC strengthens the application of the seal and investigates options to extend this to collaborative R&I activities. If a

13 https://erc.europa.eu/sites/default/files/press_release/files/ERC_Visiting_Fellowship_Programmes.pdf

14 http://celsalliance.eu/

project proposal has received a seal of excellence from the EC, the Member States should be able to fund it from their ESIF 'FP9 earmarked' funding.

A second synergy between ESIF and FP9 could be the funding of the **European Innovation and Technology (EIT) Regional Innovation Scheme (RIS) partnerships**. EIT RIS is a structured outreach scheme made available via the EIT to support the integration of the Knowledge Triangle and to increase the innovation capacity in areas and regions within Europe not directly benefiting from the EIT and its Knowledge and Innovation Communities (KICs). It is based on a two-way engagement between EIT KICs and selected partnerships from the wider European innovation community. LERU proposes that the selected partnerships should be able to benefit from the 'FP9 earmarked' funding in ESIF, once they are selected by an EIT KIC.

A third opportunity is the introduction of a return **phase for intra-European MSCA fellowships** for fellows who are originally from an widening region: the fellow would be selected and funded as is normal way but an additional year could be introduced where the fellow has the option of returning to his/her home country. This final year would then be funded via ESIF. The main purpose of these synergies would be to fight brain drain and have young, talented researchers returning to their country of origin.

In addition to the suggestion above, the EC could consider allowing ESIF to be used to **co-fund the basic infrastructure of graduate schools and career centres for MSCA COFUND activities** in lower performing regions.

The ESIF 'FP9 earmarked' money could also be used to **co-fund certain topics in the FP9 Collaborative research and innovation programme.** As mentioned above, Member States should be able to sponsor certain topics, resulting in activities which are similar to what is done now in ERA-NETS.

Specific widening schemes in FP9

It is too early to properly evaluate the Horizon 2020 'Spreading Excellence and Widening Participation' schemes. The impact of the current schemes needs to be measured over a longer term. This is especially the case for Teaming and ERA chairs whose aim is long term impact. Based on the experience of LERU members in these schemes, and on contacts with universities from 'widening countries'[15], LERU has some recommendations for the future:

- **Twinning**: LERU supports the continuation of twinning in FP9 but suggests some minor changes are made. The scale of the projects is a little too large, e.g., the number of beneficiaries is often high and projects focus on different topics and aim at creating at the same time added value for multiple disciplines. To increase the efficiency of twinning in FP9, participation in these projects should be limited to 3 to 4 institutions. Good practice exchange, exploring collaboration, and capacity building should be much more focused on one or two topics. Twinning should not only target advanced expert researchers but also young rising stars.

- **ERA Chairs**: LERU is in favour of continuing ERA chairs but advocates for some funding to be added to include research activities, at least for the first two years of an ERA chair. At present institutions struggle to find a suitably high quality person to apply for an ERA chair. Providing some funding to enable the grantee to continue his/her research would be very beneficial and will open the programme to a greater applicant pool.

- **Teaming**: Given the large amount of funding required to set up new centres of excellence and also taking into account that the impact of the funding can only be evaluated longer term, LERU proposes not to prioritise the funding of teaming projects in FP9. The EC should continue to support the current Centres and evaluate them after a number of years to see if they actually had the desired impact. If this evaluation is successful, the EC could consider launching a new teaming call.

- LERU is strongly in favour of the EC continuing the **Policy Support Facility** (PSF)[16]. The purpose of the PSF is to provide practical support to Member States and associated countries to design, implement and evaluate reforms that enhance the quality of their research and innovation investments, policies and systems. As mentioned above these reforms are desperately needed. The EC should continue to actively stimulate Member States to use the PSF.

15 LERU discussed its ideas for FP9, including on widening participation schemes with its CE7 partner universities (see http://www.leru.org/index.php/public/news/leru-and-central-european-universities-team-up-for-better-research-education-policies/)

16 https://rio.jrc.ec.europa.eu/en

Other ESIF funding priorities for research and innovation

Next to supporting synergies between ESIF and FP9 as set out above, the part of ESIF dedicated to research and innovation activities in general, should focus more on attracting and retaining talent in the future. LERU proposes Member States ensure ESIF is used to create better visibility for their excellent researchers and entrepreneurs by:

- Developing travel grants to attend scientific conferences, participate in consortium meetings, etc.

- Providing funding for organising high level scientific conferences in their own country.

- Support the participation in COST actions. LERU is supportive of COST actions and believes more 'Targeted COST actions' can play an important role in supporting institutions in less-privileged countries to strengthen their support for research and innovation.

- To support institutions in less-privileged Member States to retain and attract ERC grantees, ESIF could, e.g. be utilised as top-up funding to support the department the ERC grantee would work in.

ESIF money should also support the implementation of the open science agenda in countries where institutions have financial difficulties doing this by providing funding for the development of a digital platform for open access to publications.

FP9 funding model

As mentioned earlier in this section remuneration of researchers in institutions in some Member States is problematic. Often the basic salary is low, but topped up by providing bonuses for attending conferences, publishing articles etc. LERU is pleased with recent changes to the Horizon 2020 model grant agreement allowing these bonuses to become part of the eligible cost to be fully reimbursed. The salary a researcher gets from an EU FP grant should not be lower than the salary (s)he would get from national research grants.

When developing FP9 rules this problem should also be taken into account. Given it is important for reasons of simplification to maintain the single reimbursement rate, LERU proposes the introduction of a minimum salary or 'floor' within the single reimbursement rate in FP9. If the personnel cost is below a certain threshold, a minimum salary should be reimbursed. In parallel with this, the EC must stimulate the relevant Member States to reform their remuneration systems (see above). In the longer term it cannot be the responsibility of the EU Framework Programme for Research and Innovation, nor any other EU funding resource, to address problems caused by inadequate national systems.

11. Responsible Research and Innovation

For LERU and its universities, Responsible Research and Innovation (RRI) is very important and FP9 should fully embrace the different aspects of it. The six RRI dimensions identified by the EC, i.e. ethics, gender equality, governance, open access, public engagement, and science education – are at the core of the values universities represent. This section especially focuses on gender equality and ethics.

As mentioned in the LERU paper on the Horizon 2020 Interim Evaluation (LERU: 2016c), LERU is convinced Europe requires continued efforts to promote **research integrity**. FP9 rules and grant agreement should clearly define the RRI standards (and related documents) required. These should include: the requirement for beneficiaries to (a) have developed their own research integrity code or adopted a national or other recognised code, (b) take responsibility for dealing effectively with concerns or alleged research misconduct, (c) respond promptly to any concerns raised by other parties directly with the EC and referred onwards and (d) keep the EC informed about the outcomes of cases, wherever appropriate. Handling/investigating allegations and taking action in proven cases should remain the responsibility of the universities and other research providers. The EC should develop a certificate for meeting these RRI standards, similar to the one for project management and administration, to award to beneficiaries that meet a series of specific criteria (see 'trust-based methodology' in section 2).

In FP9 the EC should facilitate networking and information exchange among researchers on issues related to ethics and research integrity. It could do so by creating a (digital) platform for knowledge exchange (similar to Euraxess, but focused on ethics and integrity).

LERU also emphasises that, in the context of RRI more fruitful ethical debates would be possible if **ethics** was considered a proper domain of research that systematically develops excellent research on questions of science and innovation, rather than a regulatory appendix to research in natural sciences and technology. The current funding schemes are too focused on the latter function. LERU published an 'Agenda for ethics research' in 2013 (LERU: 2013a) that elaborates on this point.

Promoting **gender** equality in science and innovation is a commitment of the EU. In line with its papers on gender (LERU: 2012, 2015b), LERU wishes the EC to continue its push for gender equality and gender mainstreaming in line with the three Horizon 2020 objectives, i.e. fostering gender balance in research teams, ensuring gender balance in decision-making and integrating the gender dimension in research and innovation content. The overall outcomes of calls should (continue to) be evaluated against these objectives. Long-term monitoring of gender equality in FP9 is crucial to assess progress, to identify and solve problems and to eliminate barriers[17]. Moreover, the recommendations made by the working group on open, transparent and merit-based recruitment (European Union: 2015), in particular concerning gender equality, should be taken into consideration in FP9 (see also section 4 on MSCA). As argued above, the proposed standing evaluation panels should be gender balanced. All should receive training or guidance to raise awareness about implicit bias (gender and other types of bias) and adopt strategies to prevent it. Maternity leave cover should be funded, as discussed in LERU's Interim Evaluation of Horizon 2020 paper (LERU: 2016c).

In general, LERU is supportive of the concept of RRI. The EC should fund projects to promote its implementation. LERU emphasises the different aspects of RRI require different measures and approaches. These measures should, however, be implemented intelligently to avoid tick-box exercises. LERU does not wish to see a heavy-handed regulatory approach, bringing in an excess of bureaucracy and administrative red tape. Where robust national systems are in place, these should be accepted.

17 Some interesting observations and recommendations with regard to gender-balanced participation in FP projects, panels and the expert database are made in an Opinion of the European Parliament Committee on Women's Rights and Gender Equality.

12. Open Science and European Open Science Agenda

The move towards Open Science is substantially changing the nature of research, its evaluation and the communication and publication of research outcomes. FP9 should follow in the footsteps of Horizon 2020 by implementing the EC's Open Science agenda and stimulating its beneficiaries and the EU Member States to move in the direction of full Open Science. Insofar as possible, FP9 should support the main lines for action identified in the European Open Science agenda: fostering and creating incentives for Open Science; removing barriers to it; mainstreaming and further promoting Open Access policies for research data and publications; developing research infrastructures for Open Science; and embedding Open Science into society as a socio-economic driver.

The four top level ambitions identified by the EC with regard to the use and management of research outputs (Open Data, Open Science Cloud, alternative metrics, changing business models for scientific publishing) should therefore play a central role in FP9, together with the four ambitions concerning the relationship of Open Science to research actors (rewards, research integrity, education and skills, and citizen science).

Research Data and Open Data

With regard to research data, LERU very much welcomes Open research data as the default setting in Horizon 2020 – from 2017 onwards – and expects its extension into FP9. Following the principle that data should be "as open as possible, as closed as necessary", opt-outs should remain possible at any stage on grounds such as intellectual property rights concerns, privacy/data protection concerns or national security.

Data Management Plans (DMPs) should remain mandatory in FP9 and costs related to Open Access to research data should be eligible for reimbursement. The possibility of having the European Open Science Cloud (EOSC) offering post-project curation and preservation of research data generated by Framework Programmes should be further developed. FP9 beneficiaries should make their research data findable, accessible, interoperable and reusable (FAIR). The EOSC should also play a role in facilitating this.

The development of research data management policies facilitates the uptake of open data. Projects such as the EU-funded **LEARN** project play an important role in developing sound research data management policies and providing Case Studies of Best Practice. The purpose of LEARN (**LE**aders **A**ctivating **R**esearch **N**etworks) is to take the LERU Roadmap for Research Data (LERU: 2013b) and to develop it in order to build a coordinated e-infrastructure across Europe and beyond. The EC could also usefully fund new tools and services to support researchers in data management planning.

The **Report** of the High Level Expert Group on the European Open Science Cloud (EOSC) identifies the need for join-up between existing platforms and providers. The challenge in delivering the EOSC is social, rather than technological. The EC needs to fund local, national and regional initiatives that build on existing infrastructures, create new ones where there are gaps, and ensure that all such provision works together interoperably to create the 'Internet of things' that forms the vision of the EOSC Report. The EOSC Report also highlights the need for research data stewardship and new research data careers. There is a need to define the curricula for such professional training, and the EC needs to stimulate the development of such educational programmes across Europe to fulfil the EOSC vision for data stewardship in Europe.

Open Access to publications

Open Access (OA) to publications should continue to be mandatory in FP9, allowing for both the Green and Gold routes. The EC should work with all stakeholders to move to a position where embargoes are as short as possible and, ideally, removed altogether. Mechanisms and procedures to move to such a position need to be established and FP should take a lead in this endeavour. With regard to the "Gold route", funding for Open Access is a key factor, with the lack of funding after the end of a grant posing a particular challenge.

The funding for hybrid Gold Open Access should be at a reasonable level. APCs are currently eligible for reimbursement as part of the grant but – when paid by EC funding – there should be a cap on APCs for hybrid journals, and the offsetting of APCs against subscriptions should be mandatory

for publishers. It is important to note that APC costs should be reasonable and the EC would be justified in determining what level of costs is reasonable, the terms under which the EC will make an APC payment for research, and how the level of APC costs is determined. FP9 should consider reintroducing the FP7 post-project grant, for which researchers could apply after a project has ended, to cover Article Processing Charges (APCs).

Should the publishing sector not work with the EC to transition to full Open Access by 2020, e.g. by maintaining high APC charges or failing to engage in realistic offsetting discussions, the EC should seriously consider not funding APC costs in hybrid journals, where APC charges are commonly higher than in pure Open Access journals.

Open Access covers all research disciplines, including the Humanities and Social Sciences. The EC should continue to encourage research performing organisations, learned societies and other bodies to embrace all academic disciplines in their advocacy activity.

Compliance

The EC, Member States and Open Access stakeholders should encourage optimal compliance with the provisions for Open Access to scientific publications and research data, where necessary by funding the development of tools and services to support researchers. Funders such as the Wellcome Trust or the U.S. National Institutes of Health have high compliance rates for their Open Access mandates due to practical reinforcement measures. FP9 should take comparable measures to ensure compliance. These include uploading the Open Access full text to an OpenAIRE complaint platform (and thus becoming findable via OpenAIRE) as a condition of evaluation, as well as withholding parts of grants in case of non-compliance. The process of uploading should, however, be as simple as possible. It is important that the OpenAIRE infrastructure, as a service to advance Open Access and Open Data, can be operated on a sustainable basis – if necessary as a permanent infrastructure independent of programme funding rounds.

The use of ORCID IDs should be recommended for all EU- and ERC-funded research. There should be dialogue between ORCID and the research community to continue to deliver a system which meets the needs of researchers themselves and of research funders. The use of this author ID is an important step in moving researchers in the direction of openness.

To encourage future automated and efficient data exchange, it would be important for the EC to encourage the use of additional identifiers to enable better data matching and exchange, e.g. FundREF, and to encourage publishers to assign and distribute DOIs at acceptance of research outputs for publication.

The Wellcome Trust has recently published Open Access requirements for publishers. The EC should do the same for its funded research outputs so that researchers and publishers, as stakeholders in the research process, are clear what is expected.

Alignment of Open Access and Open Data policies

Given the divergence and large number of Open Access policies across Europe (461[18] at the moment), projects such as **PASTEUR4OA** are very much welcomed. European institutions should be strongly encouraged to align policies on Open Access to publications and Open Data around a set of agreed principles.

The **LEARN** project has similarly produced a model Research Data Management policy, and guidance for its implementation, which the EC should strongly encourage to be adopted in research performing institutions in receipt of European funding.

18 See PASTEUR: http://pasteur4oa-dataviz.okfn.org/worldwide.html (consulted on 25 January 2017).

New OA publishing models, rewards and alternative metrics

To stimulate the development of new Open Access publishing models and presses, and to encourage the exchange of ideas, FP9 should introduce funding rounds to facilitate take-up of these new publishing paradigms. Importantly, new publishing models, presses and platforms will only thrive well if they can generate enough reputational gain for researchers. FP9 should thus fund research into new ways of reputational gain, reward systems, incentives and evaluation schemes, always taking care to be aligned with Open Science principles. FP9 should also support research into, and the uptake of, alternative metrics. LERU has signed the San Francisco Declaration on Research Assessment (**DORA**) and is mindful that traditional metrics do not measure openness. The EC should encourage and fund alternative studies to explore new ways of assessing research, which find support in the research community.

In terms of new publishing models, LERU notes the development of new publishing platforms such as Wellcome Open Research. **Wellcome Open Research** can change the way in which research is curated and disseminated. The key issue here is that it is the research funder who is establishing new channels for publication. Research funders can really make a difference and change national policies and institutional behaviour. If the Wellcome publishing model were adopted for FP9, it would have major consequences for universities´ internal policies (e.g. hiring, promotion, reward). The EC should advocate this approach in the framework for FP9, for the ERC and for the Global Research Council. It has the potential to be a gamechanger.

13. Research infrastructures

Access to state-of-the-art research infrastructures is an important framework condition for scientific excellence. Horizon 2020 offers funding for the development of new research infrastructures and for the strengthening of research infrastructures' networks. However, funding alone is not sufficient to create excellent research infrastructure. There are other important factors: the quality of the staff, the governance structure, the way in which access to the research infrastructure is organised, the long-term sustainability, etc. At the moment, many of these aspects are not very well organised. For example, research funding for research infrastructure hardly ever covers running and maintenance costs, both of which are essential for the research infrastructure to stay on the forefront of scientific developments. This in turn prevents an easy access to the research infrastructures for outside users, which would be desirable from an Open Science point of view. It is essential to develop good cost recovery models for research infrastructures to help remedy this situation.

LERU proposes to develop a set of principles for research infrastructures in FP9, which would allow (potential) academic and industrial users to assess the quality of a research infrastructure and to enable the research infrastructure to show its dedication to excellent research. The main elements should include transparency in information and access policies, solid embedding in existing organisations, and clear indicators for operational and scientific excellence. Research infrastructures meeting these principles should then be eligible for funding from local, national and/or international sponsors for operational costs. This would ensure a business model that obviates the need for (high) user fees and would allow these research infrastructures to truly become hubs of scientific collaboration. In addition, LERU asks the EC to develop mechanisms to encourage cooperation in investing in new research infrastructures, especially cross-border, thereby helping to avoid unnecessary duplication.

14. Other EU research funding activities

Different EU policy fields support (some) research and innovation activities e.g. calls for research proposals from DG Justice and Consumers, DG Migration and Home Affairs, DG Health and Food Safety, DG Employment, Social Affairs and Inclusion and DG Environment. LERU calls upon the EC to harmonise the rules and procedures of these programmes in the next budgetary cycle (or even earlier if possible). All EU programmes should use the same rules and procedures for the funding of research activities and adopting those of the FP is most appropriate as it funds the highest number of research projects.

Currently several of the above mentioned calls have been included in the Participant Portal creating confusion as their funding rates, financial and administrative rules are diverse and participation in these projects often poses difficulties to beneficiaries. For example, within the Horizon 2020 rules of participation, each beneficiary is responsible and liable solely for its own activities while in projects from other DGs the coordinator is liable for all partners' activities, resulting into institutions not wanting to coordinate any of these projects anymore. In general, the complexity causes LERU members to be reluctant to take part in the research-related calls for proposals from these DGs, and others. LERU reiterates its recommendation (made in its Interim Evaluation paper, LERU: 2016c) to extend the EC' simplification agenda by streamlining the rules of participation of all EC policy-support research granting programmes in line with the FP rules, certainly in the next budgetary cycle, preferably before.

15. Defence research – research for a secure and resilient Europe

LERU understands the political and other considerations to creating an EU defence research programme and acknowledges that it could lead to scientific progress more generally and to opportunities for academic research specifically. However, most defence research is quite different in nature, purpose and modality from research funded under the EU's Framework Programme for Research and Innovation. Given the specific nature of defence research, explained below, LERU's advice is to create a programme for defence research which is separate from FP9, with different modalities specific to defence research wherever necessary, but which seeks to use similar modalities to the ones of the FP wherever possible, for the sake of simplicity and synergy.

Firstly, defence research involves different beneficiaries than those in the FP, in terms of countries and in terms of entities. Associated and third countries can and should be able to participate in FP9, but (most if not all) are unlikely to be able to participate in an EU defence research programme. Also within EU Member States, severe research constraints exist, determined by legal provisions that are usually country specific. For example, several LERU members have introduced a so-called "civil clause". In the case of German universities, the clause deals with the statutory requirement that research is to be conducted for exclusively peaceful (civilian) purposes and, consequently, excludes military or civil-military (dual use) research. This clause conflicts with the right of freedom of research enshrined in the German constitution, but as university bodies are obliged to decide not to accept funding for certain purposes, defence research will de facto be excluded. Moreover, it is not clear if universities located in Member States that have opted out from defence policy (e.g. Denmark), would nonetheless be able to participate in EU-funded defence research projects, either as project coordinators, partners or (sub) contractors.
Secondly, FP has certain modalities and conditions governing (open) access to, dissemination and use of research results governing not only publications but also research data, as well as intellectual property, research integrity and ethics, all of which are either inappropriate or ill-advised for defence research. Rather than making exceptions for defence research in FP9, LERU is in favour of creating a separate programme with different, defence-appropriate modalities, albeit under an overarching governance, which seeks to exploit similarities and synergies between FP9 and a defence research programme.

Given the particularities of defence research, the funding allocated to an EU defence research programme should not be considered part of the EU's standard support for, and investment in research and innovation. EU investment in R&I through other programmes, such as EU defence research, should not be to the detriment of the FP9 budget. On the contrary, if FP9 is to be successful and to support the EU economy and society by investing in the very best research and innovation activities, as set out in this paper, it needs a proper, decent budget. Synergies with other programmes, such as EU defence research, are desirable but cannot replace the core FP9 activities.

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