



Common Strategic Framework for EU Research & Innovation Funding

ALLEA Position Paper on the EC Green Paper

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The European Federation of National Academies of Sciences and Humanities



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“Common Strategic Framework for EU Research and Innovation Funding”

Introduction

ALLEA as the European Federation of 53 National Academies of Sciences, Social Sciences and the Humanities in 40 European countries **welcomes¹ the European Commission’s recognition**, visible in the text of the Green Paper, **that research and innovation are key drivers for smart, sustainable and inclusive growth** as it is aimed for in Europe and as part of Europe’s engagement with the wider world. It will be important that all three elements – smart, sustainable, inclusive - will be treated as equally important in the transition to the “Innovation Union”.

Principles

As we shift emphasis from knowledge-based society to “innovation union”, it is important to remember that **innovation is not a goal in itself; rather, it responds to needs of society**, to improve the quality of life and to enhance sustainability. Nor is it a simple linear process from academic discovery to commercialisation, that could be stimulated or steered easily.

If “innovation” is to be defined in a holistic fashion as **a complex and societally embedded process**, it must also consider the educational foundations of society, gender equality and intergenerational justice, more generally speaking social and cultural preferences and values, as well as economic strategies and political decisions in the respective “innovation environments”, be they national, regional, local or sectoral. Such a society-centred view of “innovation” will seek to stimulate social innovations and other forms of non-technological innovation, and will build on a more inclusive learning and innovation culture.

The CSFRI must embrace all stages of this process, wherever they do, can or should occur, from creativity-oriented and inquiry-minded education, through basic research and discovery to valorisation, and further from product development and design **to market creation**. As all EC programmes will only fund a comparatively small portion of European research, this investment must have a strategic focus and a structuring function.

ALLEA is pleased to observe the strong political commitment to the centrality of research and innovation in the Vision Europe 2020: together with its member academies, ALLEA is prepared to contribute – critically and constructively - to the translation of this strategy into reality by stimulating debates with the public and with policy makers about the long-term societal benefits that can be derived from sustained investment in education and research under the “Innovation Union”.

The centrality of research and innovation in the Vision Europe 2020 also signals a changing relationship between science and scholarship on the one hand, and market and society on the other, **“a new social contract between science and society** that

¹ A list of the 53 Member Academies from 40 countries can be found at the end of this document. The text aims at giving a coherent representation of opinions, assessments and analyses that emerged in the course of discussions, consultations and dedicated meetings with and among Member Academies and expert advisory bodies. Unless they wish so, no Member Academy is bound by any of the statements here published, nor can any of the statements be attributed to any of the Member Academies, except when they so request.

Given their diverse histories and remit not all Member Academies always agree on all issues; the text seeks to strike a balance between their consensual, creatively dissenting and constructively controversial contributions.

emphasizes responsibility for action as well as freedom for thought” (ERAB). Hence it is also an invitation also to the scientific community to reflect on how they can contribute more consciously to societal well-being with their insights and discoveries.

Process

Relying on the scientific expertise and political experience accessible through its member academies and its expert advisory bodies, and with the help of dedicated meetings, discussions and consultations, ALLEA has been able to collect and to formulate a number of overarching arguments, and some more specific ones. While these partly support the vision inherent in the Green Paper, they also represent a critique of some of its underlying assumptions, and of some of the measures proposed to resolve certain of the structural and procedural obstacles that have been identified.

The position paper comprises an introduction with some generic remarks on overarching issues is followed by the detailed responses; as suggested by the consultation proper, some of the more general and overarching remarks, observations, recommendations and requests are also included (and therefore partly repeated) in the last part of the responses.

General comment on simplification and flexibility

Simplification of administrative procedures will be welcome. While accountability and transparency need to inform all activities of the future CSFRI, all efforts must be made to reduce unnecessary bureaucratic burdens on researchers and research organisations: **more trust, less control.**

When the Interim Report on FP7 identified three agenda setters of research programming – **science for science, for competitiveness and for society** – it also implicitly warned of an obsessive quest for harmonisation when creating the framework conditions for more strategic coordination. The complexity of the existing rules can frequently be traced to the need to respond to the requirements of specific user communities or clients.

It is very important not to hide the complexity of interactions required for successful innovation cycles behind a smoke-screen of unified procedures (the previously decreed procedures were also introduced with the best of intentions, i.e. to monitor and account for the disbursement of public monies).

Simplification in the framework conditions for European level R&I funding can only be a **virtue if it does not suppress the flexibility** that is essential if those requirements are to be met. It should also be taken into account that all beneficiaries will in any case have to struggle with a diversity of national, regional and sectoral framework conditions applying to the part of the work of consortium members – often the overwhelming part - which is not EU funded.

On the other hand, further reflections on the appropriate European level funding structures with an increased emphasis on “innovation” may very well give rise to new funding instruments, especially when it comes to improving connections between different stages and sectors in the innovation process, and to linking institutional, local, regional, national and European innovation policies, which may require new more specific rules.

Coordination of national and EU R&I policies

ALLEA is confident that the renewed **political commitment to reaching and exceeding the Lisbon objectives**, albeit with a significant delay, will lead to a resounding endorsement through **stronger public and private investment in Europe's S&T base**, in all relevant areas: education, basic science and scholarship and applied research, as well as support for technological and non-technological innovation.

ALLEA as the European Federation of National Academies is aware of the important role that **Member States**, as well as governments of associated, candidate and neighbourhood countries and their relevant R&I related institutions, will have to play in bringing about the **necessary quickening of pace**. Their difficulties in translating their research priorities to actions at European level or aligning their research systems with EU requirements are frequently brushed aside as "to be overcome"; but just as frequently it is a mix of institutional (often legal) obstacles and financial constraints that prevent more rapid action.

An early involvement of the scientific community in all these processes will help to generate a common sense of purpose, that is not looking at Europe alone, since progress in scholarship and science is understood by definition as global.

With the scientific community behind it in its wish to complete an excellence-based ERA, the EC can offer robust support to national efforts in that direction.

Overall funding level

The scientific community is concerned about the decade-long experience with the slower than hoped for construction of the European Research Area (ERA). This experience shows – in both the best and the worst cases - that **strong EC incentives are needed to assist** the transition from inward-looking national research programmes towards **Europe-wide articulation of national funding schemes**. Since such is the logic of many of the new instruments, for example those that will address Grand Challenges and which are born out of national priorities, such incentives can be predicted to be of crucial importance also in the future.

In addition, **FP7** has seen unprecedented levels of participation in calls and competitions, which has led to **large oversubscription**. Yet, success rates were low, despite the increasing number of excellent proposals. Clearly there is a need for a higher overall level of funding.

Furthermore, the **overdetailed and prescriptive nature of the many FP7 calls** – led to many small calls and to the all too frequent phenomenon that certain issues were examined from one point of view only – that of the one winning consortium - , due to funding being available for only one project per call.

Finally, the necessity to integrate and to continue **making more attractive for SMEs and corporations the specific programme formats**, such as FETs, KICs, EIPs etc., can only be achieved with significantly large budgets.

For these reasons and more, ALLEA urges that a target be set for the **future annual CSFRI budget** that should not be inferior to 20 Bio. € per year. This would correspond to a total amount of **100 Bio. € over a 5-year period**. This figure is meant to represent almost a doubling of the Directorates budget for R&I funding in real terms, not simply a relabeling of several existing but separate strands dedicated to R&I.

Of the additional support thus generated some should be dedicated, in the form of incentives, to improved coordination and continent-wide articulation of national R&I activities. This may give the CSFRI **thematic leverage around “Grand Challenges” and other thematic priorities**. The funds would help produce an environment in which there will be immediate rewards for the proactive search for complementarity of expertise across borders, and for the lowering of procedural obstacles on the part of national actors, where they need to pool resources and such expertise.

Around **1/3 of the CSFRI budget should be reserved for bottom-up / blue-sky activities** of different kinds (ERC, FET, collaborative research networks etc.); also all these budget lines should at least be doubled.

Social Sciences and Humanities and Europe’s 6th challenge

All the “Grand Challenges” identified so far, such as ageing, climate change, energy, food security and transport are rooted in social change scenarios (or must be tackled in this context). Yet, critically, so far the social, cultural, geopolitical, legal and diplomatic specificities of the position of Europe have largely remained sidelined in the discussion; its responsibility for dealing with these “Grand Challenges” have not been systematically explored as part of the new European foreign action.

This is why, we developed a set of large core **research questions of crucial importance for the future European societies, of European polity and of Europe’s standing in the world** (such as: *Memory, identity and cultural change; employment, education and working lives; and inequality, families and the quality of life*). Building on these questions, **ALLEA urges that an independent 6th challenge is recognised, that deals with the topics, for which SSH expertise is central**: such a challenge would comprise large topics such as “*building resilient societies*”, would look at foundational issues such as “*education, inclusion and employment*”, and would also deal with the challenges arising from *Europe’s new role in the World*. This 6th challenge would address, with the tools of SSH, some of the key social, economic, cultural and political problems and opportunities that the EU needs to face as part of its internal cohesion policy and its external repositioning.

In its efforts to understand and promote a new innovation culture, the CSFRI will need to **give greater importance to the concept of “social innovation”**; for this, involvement of experts for the development and deployment of cultural and societal knowledge is essential. Identifying opportunities for social innovation should aim at enhancing societies’ ability to engage with other (technological and non-technological) innovation processes: so far, numerous institutional bottlenecks have prevented Europe from developing innovation-friendly cultures. Europe, its institutions and industries themselves need to innovate.

With these new foci added – including research on and research leading towards “social innovation” – **the budget of the SSH sub-programme should be approximately 3 Bio. € over a 5- year period**, with an average of 600 Mio.€ per annum), with the other 2/3 being divided over the other intra- and extra-European themes, and with approximately 10% for transversal activities (foresight, indicators, infrastructures etc.).

It goes without saying that all work on societal Grand Challenges, irrespective of the lead discipline, need the participation of SSH teams.

Working together to deliver on Europe 2020

1. Making EU R&I funding more attractive and easy to access for participants (Single entry point with common IT tools; one-stop-shop for support; streamlined set of funding instruments covering the full innovation chain; further administrative simplification):

Overall budget

Core to the attractiveness of any funding programme is the likely return on investment (here: investment of effort to apply): the first condition for attracting excellent researchers, therefore, is that the **overall budget of the future CSFRI matches the centrality of its expected contribution to growth across Europe in the longer term**, and that the allocation of funds is justified in terms of scientific excellence.

ALLEA argues that a target for the future annual CSFRI budget should not be inferior to 20 Bio. € per year. This would correspond to a total amount of **100 Bio. € over a 5-year period**, almost a doubling of the Directorates budget for R&I funding in real terms under FP7 (no relabeling of several existing but separate strands dedicated to R&I).

Simplification / harmonisation vs. flexibility

Alongside this, any meaningful **simplification of administrative procedures** will be welcome. While accountability and transparency need to inform all activities of the future CSFRI, unnecessary bureaucratic burdens on researchers and research organisations can be reduced: excessive micromanagement and control (e.g.: time recording) should give way to **more trust in the good faith of researchers**. A “**higher rate of tolerable risk errors**” should be admissible.

Simplification in the framework conditions can, however, only be a virtue if it does not suppress the flexibility that is necessary in order to cater to the needs of the R&I communities. The CSFRI needs to take into account the multiplicity of new actors that would be attracted (and of their needs), **were the CSFRI budget doubled in real terms**. **A wider sector of market and society actors would then successfully be included** among applicants and parties to be funded, and the chances are that there would be a need for greater – not lesser – openness and flexibility of approaches.

The centrality of R&I should not generate a greater centralisation of **bureaucratic procedures**: rather, the support function **should be designed with the diversity of clients in mind; simple, supple and easily adaptable** ground rules (for applications, budgeting, accounting, entry and exit from projects etc.) will serve most parties. This can include simple measures, such as making the requesting of lump sums and flat rates only a voluntary option across all applications.

The objective should be to attract not more, but better and more relevant participants (whichever part of European or global society they are rooted in); to this end, **a higher number of qualified and motivated support staff (science officers)** with knowledge of diverse sectors of societies, in-depth understanding of the field and an ability to serve successful applications from beginning to end of a project cycle, will achieve more (also at the science and policy interface) than reliance on IT tools, simplified brochures, and the like.

Diversity of applicants

It goes without saying that **eligibility criteria** can (and should) be **further clarified** and that barriers to application should be lowered in as many ways as possible, provided that the selection continues to be based on excellence (with relevance to be considered a sub-criterion of excellence in terms of the respective Call).

Participation opportunities should be as open and inclusive as possible and should reflect the inclusive nature and the potentially global reach of the CSFRI.

But it would be an illusion to assume that a 200Bio.€ programme (CSFRI + structural / cohesion funds), open to applications worldwide from very heterogeneous sets of actors, could be administered with a “one size fits all” approach.

Some problems: selection; success rate; time to grant

First and foremost, to increase the likelihood that outstanding researchers will choose to apply also under the thematic lines of a future CSFRI, it is essential to **involve leading figures in research from an early stage in the planning** of the content dimensions of the thematic work-programmes, and to ensure that some of them are also willing to serve on the evaluation panels for sub-programmes other than the ERC.

Given the **low success rate under most calls under FP7**, applications under the CSFRI might become **more attractive if a two-stage selection process** for proposals signalled to part of the applicants at an early stage that their project would not be up to the required standards; unnecessary time spent on project preparation could be avoided.

EC funding programmes continue to be plagued by the **long time that passes between the proposal for a theme to be included in an annual work-programme, the launch of a Call, and the final access to grants.**

While a cross-service acceleration of TTG (time to grant) would be desirable at the level of single source EC-funded proposals, the real challenge to be overcome will lie in the emerging new funding structures which will increasingly involve national and other actors as decentralised funders: these are not accustomed to, and often reject, the notion of adjusting their decision-making cycles and procedures to higher-level needs. Here, incentives and clear rules to be imposed by the EC as a condition for additional funding will certainly be critical, to avoid the risk that the best designed collaborative research schemes may collapse because of the adherence by partner institutions to regulations that no longer stand the test of time.

For research outside established targeted programmes, an **open call** should be considered.

Support for underrepresented MS

At a practical level, also the following measures would be helpful:

- **specific support mechanisms** to make better use of the research capacities in **many of the EU12 countries and candidate countries** currently under-represented among the beneficiaries of FP6/7 support, including:
 - better support, training and monitoring for the NCP's;
 - training in application skills and best practice arrangements for the management of larger grants;but also:
 - Inclusion of more highly qualified reviewers from EU12 countries.
- clear (and early) signals of **areas of continuity with FP7 (so that preparatory measures already taken or planned by some countries can have the desired effect)**;
- progress with regard to simpler rules on eligibility of costs, taking into account national, institutional and sectoral specificities;
- **meaningful spread of sizes of grants**, so that both entry-level participation and the participation of SSH researchers is facilitated;

- **longer duration of awards** / project lifetime, so that they exceed the standard duration of nationally funded projects (e.g.: five years);
- **redesign of any remaining matching fund percentages**, to be differentiated for each country in line with per capita income (since in most projects it is salaries that vary from country to country, unlike most other research related expenses).

Evaluation

The current emphasis on simplification and harmonisation in the pre-application administrative services and post-award monitoring and accounting requirements should not blind us for the need to develop **more transparent and appropriate criteria** for the selection itself, and for each stage and sector involved in the innovation process.

Also the criteria for the **selection of the evaluators for scientific excellence** must be made more transparent. For this, further efforts in constituting a European peer review college for the assessment of the S&T quality of proposals might be helpful.

In many cases, pragmatic and practical revisions alone may have the desired effect of real simplification (e.g.: **two-stage selection process** for such large scale projects as here envisaged).

By the same token, large-scale programmes intended to advance research on “societal grand challenges” may need to involve **non-academic stakeholders** (end-users) at different stages **in the evaluation processes**: a very fine balance is needed here in order not to overturn the hard-won freedom of the scientific enterprise, while generating and maintaining a strong societal buy-in into that same enterprise.

2. Coverage of the full innovation cycle from research to market uptake:

It is critical that the **CSFRI must not be driven by a simplistic understanding of innovation**.

The linear approach to innovation that seems to underlie large parts of the Green Paper underestimates the complexity of the dynamics driving research and the process that, often thanks to serendipity, leads to breakthroughs. Innovation can and should be stimulated through appropriate framework conditions among researchers, investors, end-users etc., but it can be neither decreed nor predicted. An innovation culture does not grow overnight.

Preparations for an “Innovation Union” that subscribe to the inclusive notion of “innovation” as explained in earlier sections would therefore have to start by stimulating its citizenry to be open to innovation, and to reflect and, where appropriate, embrace the opportunities offered by science and technology to improve lives.

Curiosity-oriented and inquiry-based education

It is critical for the capacity of a society to absorb innovative products, services and thinking (whether with regard to climate, energy, food, health, media, transport or well-being) and to make well-informed choices that the **citizenry that is literate in core concepts and ideas of the STEM fields** (science, technology, engineering and mathematics). For this reason, an understanding of the technological basis of all human societies, but in particular contemporary and future societies, should be an integral part of school and post-secondary curricula. Overall, the Europe 2020 strategy with its vision for a social market economy for the 21st century should rest on a commitment to MS investment in better education (individuals and institutions).

The innovation cycle depends on a creative and diverse workforce; yet, currently many countries in Europe report that they face difficulties in **attracting more girls and minority groups to STEM education and studies**; EC funding might be directed towards seeking to make STEM education more attractive for these groups.

Support for exploratory research into (and, perhaps, even experimental roll-out phases of) such efforts at **rejuvenating STEM curricula** will be necessary. An understanding of **core business, entrepreneurial, financial and commercial concepts**, practices and rules should also be integrated into curricula **alongside the classical scientific and humanistic disciplines**.

The **ALLEA Working Group on Science Education** is already engaged in exchanges with the EC services on inquiry-based science education at both the political and the operational level, and is ready to provide advice, support and input wherever needed.

Social innovation

ALLEA takes note of the fact that a very large component of future innovation will occur through **“social innovation”**.

Research into “social innovation” should be part of what ALLEA wishes to see emerge as the funding of a “6th challenge” that would address with SSH research some of the social, economic, cultural and political challenges and opportunities that the EU needs to face as part of its internal cohesion and external positioning (ageing; health; finance; labour market; identity; creative industries; public sector; diplomacy; global justice; well-being; technological choices etc.).

Given the urgent need for additional **data-intensive research for policy support** in these domains, and the need to involve multiple schools of thought and approaches, an annual funding level of 600 Mio.€ under a “cooperation”-like scheme (3 Bio.€ over 5 years) seems to be the absolute minimum.

SSH research in Europe reaches far beyond ancillary services (ethics; risk management; etc.) to technology based research programmes, and can help to create the core of the future European identity as a globally distinct knowledge-intensive, justice-driven, democratic political entity and social market economy.

It should not be underestimated that here, too, entirely **new forms of ex-ante and ex-post assessment may become necessary for evaluation in the field of “social innovation”**.

In the EC funding portfolio, the blue-sky ERC funding mode must be doubled, as it unlocks frontier knowledge.

Following up on the notion of the full cycle, that would start with a grounding of national and European science systems in basic research, capable of breakthrough discoveries, ALLEA is convinced that a **substantial part of the future CSFRI should remain available for exploratory fundamental research**. This is particularly important for the funding areas defined as “Grand Challenges” or other already selected for Joint Programming Initiatives or similarly large scale EIP’s.

Where areas of strategic importance for research have already been identified by political decision-makers, both the **bottom-up FET-Open and top-down FET-Proactive** funding mechanisms, successfully tested for the field of ICT, could usefully be expanded to other fields.

Support for the next steps after discovery (from the thinking about moving from idea to market, to actual **support for demonstration projects**) – as currently partly accessible to ERC grant holders – should be on offer also for other awardees in areas of

fundamental research, especially where local institutions fail to provide the necessary support.

Appropriate mechanisms still need to be developed for an equivalent support scheme for research carried out in the various areas of SSH, **where social innovation is the objective** (e.g.: business models; public policy intervention; creative industries etc.).

Furthermore, across the full funding portfolio (all four FP7 pillars and their successors), **blue-sky research must be guaranteed easy access to resources**, once it reaches the point where socio-economic impact can be envisaged, **in order for its results to be fed rapidly into “innovation processes”** in the traditional sense. An easy-to-access **support scheme or top-up for spin-offs that have developed out of EC funded projects** might be an incentive for some academic environments.

Also the experiments of the Knowledge and Innovation Communities (**KIC's**) of the EIT, which aim to accelerate market uptake, will need **to be monitored carefully, to draw lessons** for wider application.

In fact, all forms of **networking that bring together actors from the sectors of education, research, industry and end-user communities** is potentially useful.

Lately, the introduction of **EIPs has lent new dynamics to the cross-sector integration of R&I activities**. The future CSFRI would have to provide sufficient advisory capacity to ensure that, with this multitude of formats available, actors can make the appropriate choices for the kind and level of alliances and integration they need to advance their research, product development or market-entry.

Demonstration units may be created that would help to reduce reluctance to invest in the necessary transition from the phase of academic research towards industrial production, thereby overcoming what has been called the “point of hesitation”.

Technical validation and market simulation of innovative products targeting challenges in non-European ICPC countries should also be eligible for support, provided that they are under as strict a set of regulations as they would be under the laws applicable in the EU

There should be better coordination and integration of the existing tools of DG R&I (FP, CIP, EIT) and the cross-directorate coordination of research activities, for example in the fields of agriculture/food, environment, health, transport, especially in view of the “Grand Challenges”.

As part of the internationalisation strategy, efficient tools will be necessary that allow global collaborative research ventures to address IPR aspects at an early stage in what may turn out to be an innovation process.

The introduction and encouragement of **public procurement policies** for innovative products or practices – initially if and when they conform to the strategic innovation agenda - should be considered. One might also envisage or **competitively awarded support for political or public sector entities or communities that designed particularly convincing schemes to introduce such innovations**. In order to narrow the potential gap in uptake between the different regions of Europe, additional support (a higher percentage?) could be provided as part of the structural / cohesion funds and other funds destined to secure the livelihoods of professional groups or otherwise promote the inclusion of communities (CAP; fisheries; ESF, etc.).

Given the elements listed above – the fundamental value of education; the necessity of a strong basic research base; the role of social and institutional innovation; the new formats to stimulate use of innovative products - more effective use of the instruments and their management might be achieved not by streamlining them into a single chain, but rather by a clearer profiling of the different support functions that they can fulfil.

A **wholesale moratorium on new funding formats** – as suggested by the interim report on FP7 – might perhaps be the proper reaction to the multitude introduced under FP7. But if such a moratorium were imposed, it **risks stifling the creativity** that the current rethinking of the EC's R&I funding logic wants to trigger.

3. Characteristics of EU funding that maximise the benefit of acting at the EU level, incl. emphasis on leveraging other sources of funding:

In earlier policy papers, ALLEA has already spoken of the **triangulation of the European Higher Education, Research and Innovation Area** as the arena where Member States and others cooperate. The underlying assumption of this triple acronym (EHE/R/IA) is that there is a political will (in governments and other relevant national institutions) to create and employ legal and fiscal measures that allow the borderless, unobstructed functioning of science and scholarship Europe-wide.

ALLEA is confident that with the **renewed political commitment to reaching and exceeding the Lisbon objectives** will lead to a resounding endorsement through **stronger public and private investment in Europe's S&T base** in all relevant areas: education, basic science and scholarship and applied research, as well as support for technological and non-technological innovation.

Networking

But even with these broad framework conditions in place, substantial support and incentives from **EC programmes** will be needed, notably in order **to facilitate the transnational networking of researchers at all levels (junior to senior, basic to applied research)**, as well as institutions and different sectors.

In practical terms, this would include:

- a further strengthening of COST [provided that the robustness of peer-review can be further developed],
- a more efficient and easy-to-use mechanism of the EUREKA kind,
- support for new fully-funded, but externally managed schemes for small scale exploratory grants and networks under broad thematic headings (of the kind first experimented under the EUROCORES scheme);

What is still needed is **better cross-border cooperation (also of national funders)**, which should ensure more frequent and **less cumbersome processes of pooling of resources** at the programme level or, at the individual or project level, **improved portability of grants**.

Overcoming fragmentation

Failure to leverage the funds of MS (or their institutions) for smaller and large-scale collaborative research ventures has proven in the past to imperil the success of much-advertised new tools, even those of comparatively small size, whether in basic science and through subcontracted agencies (the ESF's EUROCORES scheme), or in areas where targeted basic research was invited (when lower than desirable commitments were registered in some ERA-Nets) or in new forms of support for PPP's and their

consortia, such as the Joint Technology Initiatives. The CSFRI must draw lessons from these experiments.

Overcoming the **fragmentation and vast socio-economic differentials that characterise Europe's scientific institutions** is still a challenge, even more so when it comes to integrating candidate and neighbourhood countries. All measures that lead to a more complete integration of researchers and their institutions into wider European forms of cooperation will be valuable. In this context it may be desirable to consider more **effective forms of support and cooperation for specific regions** (e.g.: Western Balkans; CIS; Southern and Eastern Mediterranean).

In the areas of strategic themes, EC funding interventions will be needed in order to facilitate the:

- creation of critical mass on "Grand Challenges",
- tackling of transnational and regional issues through clustering;
- coordination of strategic R&I programming across borders;
- creation and support for a new generation of TT-offices, that would actively support the growth of an entrepreneurial culture among researchers.

Re-distributing excellence

Alongside the welcome impulse given by the ERC to the europeanisation of the outlook on funding individual excellence, an interesting experiment has evolved in order to deal with the low success rate of ERC applications: the ranking lists have been made accessible to national funders with the intention of encouraging them to fund the best applicants from their countries that were just below the cut-off line. One could speculate about a support scheme that would grant, within the pre-defined highest brackets of proposals worthy of funding but not funded due to the ERC's budgetary constraints, a substantial **EC top-up for the national funding of such highly-ranked applicants not directly funded through the ERC**, but based in or intending to go to European countries otherwise underrepresented in the ERC funding universe.

The necessary financial support should not come from the direct ERC funding pot, but could be drawn from a resources to be set aside under the structural / cohesion funds, following prior agreements with potential national, regional and local funders. Rapid allocation (without additional scientific review) should be possible following contractual commitment of the national, regional and local funders to provide their share. Management of such grants would follow locally applicable rules, with the EC support being awarded as a grant with minimal end-of-award reporting duties.

For any collaborative scheme – with its many applicants from different countries and typically different sets of organisations - such a scheme would be much more difficult to implement.

4. Should EU R&I funding be used to pool MS resources, in particular: should JPI's between groups of MS be supported?

The renewed commitment to reaching and exceeding the Lisbon objectives depends on the willingness and ability of Member States, as well as of governments of associated, candidate and neighbourhood countries and their relevant R&I related institutions, to **relinquish some autonomy in order to prepare for enjoying the long-term benefits of the European Research Area (ERA)**.

In a number of countries, alignment of government policies and institutional priorities with EC priorities is far advanced; overall progress still however needs to be made in terms of

mobilising national funding capacities in the public sector and connecting them with their counterparts across the EU and in the respective regions, **but also with private investors and funders.**

Experience shows that **strong incentives are critical** in order to move national research programmes towards conscious Europe-wide articulation: such support for coordination and articulation costs should not be primarily meant to increase the ability for thematic leverage (though this may be a consequence, too), but would be expected to **produce an environment in which there will be a proactive search for complementarity** of expertise and for the **lowering of procedural obstacles** on the part of national actors.

Research Infrastructures

A **successful example** for the creation of critical mass (with tangible benefits for all parties) is the progress towards a truly transnational European, partly even global, division of labour in the **construction, management and use of large-scale research infrastructures**. The structuring effect of the ESFRI roadmap on medium- and small-scale RI's at local, regional and national level, as well as on the worldwide positioning of European research, may hold useful lessons for similar exercises in pooling national resources for very large-scale thematic programmes, such as JPI's.

Diversity harnessed

On the other hand, Europe can probably still **draw strength from the diversity of national R&D traditions** (and indeed from the traditional national and regional rivalries). ERANets, Art.185, and JPIs offer different levels of investment and complexity for thematic coordination and clustering of national priorities, for the identification of relative strengths (and resulting complementarity) of national science systems, and use EC support as glue money and for facilitation purposes.

In addition, JPIs have arisen from priorities identified in MS, and this "bottom-up" approach to high-level and large-scale clustering is certainly welcome, as it makes the best of the traditional diversity of the European research landscape (as well as of socially and politically favoured areas of intervention of public sector funding agencies).

EC support can also help to ensure **long-term commitments by all participants in JPI's**, of sufficient basic research components, and of international non-EU partners wherever necessary.

Some peer-reviewing of the award structures devised for the large-scale funding initiatives (JPI's etc.) may be considered, in order to ensure that stakeholder pressure does not create biased funding formats or, indeed, thematic choices.

Equally important will be **support for small MS and their research systems**. For reasons of scale and scope they evidently cannot participate in all major programmes, but they should nonetheless be encouraged (and, where financial assistance is necessary, assisted) to have **at least delegates / observers in these large scale programmes, especially where pre-market-entry options** such as public procurement support may be contemplated at a later stage. Measures may also be taken to ensure that in those countries capacity is built for adequately dealing with the new technologies, products or services by setting aside funds to train young researchers in situ in the related fields.

For full and regional JPI's to boost the strategic priority areas for research, **large-scale EC support for the cohesion of JPIs initially** would have to be **limited to those areas**

that have continent-wide or at least EU involvement and importance, though regional specificities should also be reflected in “Grand Challenge” approaches.

Support could, however, also be made available for **new fields of research in specific regional contexts**, where large enough consortia of MS, non-EU members and/or business actors emerge (for example issues related to policies in the Danube region, the Black Sea, the Mediterranean, the Alps, the circumpolar world, or the extreme peripheries).

ALLEA Member Academies have established and are involved in numerous such **regional networks** of research organisations, and are able to provide advice on the emerging fields for which such targeted action is necessary.

Comprehensive large scale programmes

As a rule, large-scale activities aspiring to obtain EC support – especially in the “Societal Grand Challenges” and similarly motivated JPIs and EIPs - should always seek to include SSH teams in the group of scientists developing the science plans.

By the same token, consortia and nationally funded components should always include relevant SSH teams (in the same country or, within a smaller programme, also across borders); without this there is a risk that the societal dimension of the challenge remain under-researched.

5. Balance between smaller, targeted projects and larger, strategic projects:

Mix of sizes

Evidently a healthy mix of both kinds of “projects” is necessary. The **optimal size** of the funded project or programme will **depend on the research question** or challenge to be tackled. This becomes a more important consideration as EC funding is used increasingly not just as single source funding, but also in order to advance the creation of critical mass out of the pooling of national funding across borders and sectors.

It would be advisable therefore that in the **planning of large-scale programmes** such as JPIs some time is spent, immediately after setting the thematic priorities and prior to drawing up overall funding targets, on the **necessary mix of projects of different size** (and related funding formats) under such a programme. The view of leading scientists on the optimal size of projects and their mix, depending on the tasks to be accomplished, should also be sought.

It goes without saying that **JPIs that aspire to produce innovative solutions** will have to **set aside substantial funding for smaller-scale blue-sky research**, provided that proposals can, very broadly speaking, point to possible contributions to the respective “Challenge”. Calls under large programmes could also encourage smaller components (e.g.: for networking, capacity building etc.) to be included in applications packages; this would also encourage co-leadership to evolve.

Challenges and approaches

All responses to challenges should encourage a plurality of approaches and be driven by overarching large questions; this in itself requires a very significant scaling-up of the total amount of funding available under the R&I directorate: the more complex the research questions and societal challenges become, the more room should be given to a variety of approaches and solutions, so as to avoid path dependency.

The inclusion of SSH components in all Grand Challenges will lead to a wider spread of grant sizes, since it is generally assumed that SSH projects are better designed on a smaller scale.

The understanding of the notions of “small” and “large” projects varies, clearly, from field to field, and from country to country. Some argue for the maintenance of the 60:40 ratio between smaller and larger projects, but this may be impractical in a significantly expanded 200 Bio. € programme (CSFRI + structural/cohesion funds).

Rather than a predetermined ratio, there should be a shared understanding across services that strategically targeted **large-scale programmes also need to include a substantial portion of funding components for smaller, curiosity-driven and, often enough, high-risk projects**. Support for such projects should therefore not be limited to the ERC or national funding streams alone, but should also be attracted where Grand Challenges require and invite proposals for new, innovative solutions.

By the same token, **smaller projects** and even programmes should have **easy access to top-up funding for relevant networking and clustering with related activities**, whether funded under the CSFRI, other EC funds or national funds in member, associate, candidate or neighbourhood states.

Management issues

High management requirements for large-scale awards risk opening up a split across Europe in the geographical distribution of lead institutions, since institutions in certain countries are ill-equipped to handle such awards. This is why especially in areas in which the EC has substantial experience with the appropriate size and structure of management tasks, **better guidance could be given to applicants** (improved templates), targeted to the specific size of the Call, regional and domain- and sector-specific needs and requirements, if any.

As an immediate measure for upcoming evaluation rounds, more complete information about the management capacities and experiences of lead applicants / coordinators (or their appointed management agent) in terms of handling different grant sizes should be requested (track record, also for non-EC grants; staff structure etc.).

Under a significantly enlarged budget of 100 Bio. €, there is the inevitable risk that the labour-intensive processing of smaller grants for collaborative research (up to 2.500k €) will be discontinued for reasons of increasing work load. In order to avoid this – having pointed to the value and necessity of smaller grants for a healthily innovative research landscape in Europe -, the involvement of professional awarding organisations with the relevant peer-review tools in place (national, regional, charitable funders or research institutions with relevant experience) should be considered. This might prevent a ballooning of the workload for the EC desk officers. To some extent, a similar mechanism has been successfully tested in ERA-Nets and under some CO-FUND arrangements - the JPI's, too, rely heavily on decentralised award structures. Ultimately, such decentralised schemes may also contribute to a stronger buy-in by such institutions and organisations.

6. Balance between a unique set of rules (radical simplification) and flexibility and diversity needed to achieve the objectives of different instruments, considering the needs of different beneficiaries, in particular SMEs

There is little difference in the needs - in terms of transparency and low levels of bureaucracy - between research-intensive public and private organisations (whether institutes or SMEs).

Unique sets of rules

“**Unique sets of rules**”, on the other hand, while attractive from a central management point of view, would be impractical and inappropriate: **they cannot possibly capture the needs of the complex research and socio-economic interactions that the CSFRI would like to champion**. For example: lump sums payments and caps on overheads (which discourage institutions that have introduced or are planning to introduce full economic costing), or IPR requirements that may lead to an uneven playing field between public sector and private SME participants in a consortium, or, again, definitions of eligible costs and of matching funds that risk preventing CSO actors – or indeed entire sectors of national research communities – from applying.

It is also true, however, that in some countries (typically newer accession MS and candidates) there is a hope that stricter (simpler and more transparent) EC-inspired rules would help to rejuvenate an overly bureaucratic national funding system, in which the predominance, in the selection process, of excellence over other concerns is not always guaranteed.

In this context, it might be worth considering a **common set of evaluation criteria** – shared across the entire funding portfolio – but with different weighting of the single criteria, depending on the kind of activities that should be supported.

In the interest of reducing non-research related workload for the beneficiaries and of allowing them to focus on their R&D tasks there is, on the other hand, room for the simplification of accounting (and auditing) procedures, avoiding duplication of labour and striving to accept, wherever possible, existing national practices, and offering, wherever necessary, assistance for the convergence and processing of data required for reporting, mainly by providing free of charge the appropriate IT tools. An extra effort could also be made – to allow, for EC reporting requirements, existing management and accounting practices at national level.

Furthermore: while it would reflect a successful narrative of conditions for economic growth in Europe, a single-minded focus of a future CSFRI on SMEs would signally fail to recognise the enormous R&D investments made by the largest **global corporations** - increasingly also in Asia. European science policy makers might want to reflect on the need to create better conditions for European researchers in their interactions with these economic and R&D powerhouses, especially where the home-grown research intensive SME basis is weak. Again, region- and sector-specific rules appear to offer the best chances of reacting adequately to new (and not so new) challenges.

7. Measures of success and performance indicators for EU R&I funding:

It is to be recognised that interim and ex-post evaluations of FPs has made significant **progress from FP5 to FP6 and FP7 in terms of measuring scientific output and impact**. By now, a number of EC-funded and nationally operating agencies and consortia, together with the EC services themselves, are providing very good datasets. This practice and the mix of networked and centralised collection and analysis should be continued, indeed strengthened.

Ideally, it should be linked to similar data-generating and processing at other levels and, where necessary, the EC could launch a large-scale effort to ensure that **meaningful and compatible data-sets** are generated at national, regional and institutional levels.

There is consensus among Academies that **indicator-informed peer review remains the evaluation tool of choice** and that it has a central role to play in practically all activities, from single projects to system assessment.

For the use of indicators to be more than a mechanistic exercise, **agreement on politically and scientifically meaningful goals** of a specific investment in science needs to be reached. To the extent that the success of individual programmes and their components will then need to be measured, it is imperative that these goals are cast in a very clear and realistic form (ideally: SMART).

Societal impact

Indicators for societal impact, or even more narrowly socio-economic impact, present – both methodologically and in terms of the existing data - much more of a conundrum. To start with, there is often the need to **take the long-term view**; it is necessary to trace back and translate into figures contributions to changes in behaviour (due to the availability of new choices; for example: the internet), but also contributions to public debates and political decision-making (for example: GMO's), and even to profound rearrangements of societal structures (for example: family planning).

ALLEA's expert working group on Evaluation is currently discussing these and related issues of measuring societal impact, and will be happy to exchange views with EC services on the appropriate ways forward.

SSH indicators

Outside the sciences, even scientific indicators are often barely available: for example, until recently **data capture of SSH-research** by OECD was **very sketchy indeed**, and while efforts are now being made to remedy this, even in terms of scientific impact the databases of research literature are still far from satisfactory; the same holds for some engineering fields, and areas such as law – both fields of crucial relevance to process, product and social innovation.

While it is, methodologically, in most fields comparatively easy to generate indicators for “science for science” (publications; network analysis in terms of collaboration, inward and outbound mobility at different levels, etc.), relevant indicators for “science for competitiveness” (incl. innovation: patents?) and “science for society” (societal impact?) are much harder to come by. With contributions to “innovation” so difficult to measure, the scope of the intended investments under CSFRI alone would justify, in all likelihood, an immediate substantial investment in S&T studies: such an investment would aim for the **production of better (and more widely accepted) indicators and for the appropriate data collection methods**. Ultimately, better tools must be put in place and some support must be provided for the collection itself.

Ideally, the envisaged composite or more “complex” indicators should already be available in view of the first major decisions to be taken under CSFRI: clearly numbers of patents and the level of activity of the TTOs, while perhaps currently accepted as useful proxies in institutional evaluations, are not suitable indicators for programme assessments, where one key function is the connecting of networks and sectors..

Considerable progress could also be made with the introduction – Europe-wide – of a **comprehensive research information system**. Recent experiences in the US show the deficiencies of single-actor systems that are currently under development: they risk principally capturing federally funded research in the sciences, while overlooking the very substantial regional (here: state) investments and their impact, or indeed the effects of investments by private enterprise and charitable foundations. Furthermore, the longitudinal changes triggered by relevant contributions of SSH research and related

social innovations are hardly visible under the scheme currently contemplated. Experiences in Brazil and Egypt, but also in Norway and Belgium are more comprehensive. At European level, a first attempt has been made for some ERA instruments with NETWATCH – but coverage of the other activities under DG R&I and of those of external funders (national, regional, foundations private sector) is not achieved (or currently not intended). Besides, in all these cases the research information systems are linked to less than satisfactory publication databases; a comparison also shows that they struggle to cover other forms of societal impact, which we have described as crucial for more comprehensive, future assessments of research in society.

EC funding could produce a new comprehensive structure for the capture, processing and analysis of relevant data.

Such a database could start with the **accurate depiction of research being conducted across all EC directorates and its impact**, with the possible side-effect of promoting cross-directorate synergies. A single, user-friendly data capturing and research information system on themes, participants, objectives and results should, however, be **designed in such a way that other funders** (public [national, regional, local] and private [philanthropic, business]) **can also include their data**. An alternative method for populating the system would be to use such a database also as a reporting tool, and therefore to put the burden of entering data onto the recipient organisations.

There are potential **positive side-effects related to the visibility and accessibility of R&I-related information and expertise and in terms of partner search**.

More robust methodologies will need to be developed in terms of **capturing and interpreting weak signals about imminent and emerging science and technology developments**; it might be useful to **involve Academy members in horizon-scanning** exercises where they can provide some signals and some specialised insights. Academy institutes are also now very experienced in national and sectoral foresight exercises. But a great deal of qualitative work will still need to be done by the more SSH-related sectors of the STS community (e.g.: achievement of the strategic Europe 2020 goals).

8. Relations between EU R&I funding and regional/national funding (incl.: complementarity to funds from Cohesion policy and the rural development funds):

While the proposed CSFRI rightly assumes the centrality of R&I for progress in Europe, it should however be seen as part of what has been sketched as a much more **encompassing vision of investments into a common European future: the budget review 2010**, for example, suggested a common strategic framework including Cohesion Fund, European Regional Development Fund, European Social Fund, European Fisheries Fund and the European Agricultural Fund for Rural Development, all aligned in order better to deliver on the priorities of smart, sustainable and inclusive growth.

In this context, a **matching of funds (100 Bio. € for CSFRI and 100 Bio. € for R&I support funding lines of the cohesion fund** for the 5-year period under discussion) will be welcome. Detailed rules for the use of the future cohesion fund will need to be developed; but as it is expected to hold a special responsibility for promoting the further sustainability of Europe-wide innovation investments and policies through **smart specialisation approaches, some areas of potential and improved interconnectedness with CSFRI funding** can be pointed out here:

- **research infrastructures**, regional partner facilities and upgrading of research facilities;

- **regionally specific grand challenges** (or interpretations of the EU grand challenges);
- **regional cross-border clustering** and Europe-wide capacity building (for example between universities, research institutes, etc. incl. staff exchange etc.);
- co-funding arrangements for excellent ERC projects, especially in countries underrepresented among the awardees;
- capacity building in management and higher education institutions.

While cohesion funding of R&I activities is supposed to be functioning as a form of capacity building, one should not discount it as a tool to connect clusters across borders into “clusters of clusters” and eventually **regional centres of European excellence**.

But while strong R&I policies should be an integral part of regional development plans, there are **no guarantees for success connected to such redistributory measures**. Capacity building in Higher Education and research as part of regional policies can be a very long process, that demands a long-term political and social commitment.

There are other vast funding streams that could have bearing on research into Grand Challenges. With food security and ecosystems services emerging as major concerns of future EU and global policies, research funding under the CAP and EU fishery policies should be brought into the picture (in many respects also closer coordination with DG Dev will be necessary and should lead to jointly funded research programmes). DG Energy, for example, runs entire independent programmes, large (SET-Plan) and small (RFCS: Research Fund for Coal and Steel)

ALLEA is aware of the problematic nature of combining excellence and cohesion objectives for some aspects of the argument developed above. An amalgamation of CSFRI and future cohesion funds – even when both are directed towards fostering R&I – would be unsuitable, since they fulfil different, albeit complementary functions.

The most serious **concern about frequent intersections of future FP and cohesion funding is in the realm of simplification**, as it will be close to impossible to introduce the same level of simplification and risk tolerance across both schemes.

Tackling Societal Challenges

9. Societal challenges and the balance between curiosity- & agenda-driven research:

While Europe-wide agreements on “**societal grand challenges**” are the **outcome of a public and political process, the scientific community should be closely involved in the shaping of the resulting research agenda**. For this, a number of adjustments of current practice may be necessary, as it seems to be currently possible, for example, to define a societal challenge without the involvement of SSH researchers.

In terms of percentages and possible funding schemes, the following are some of the thoughts that have emerged during ALLEA-led discussions among Academies:

- In the problematic continuum “discovery – application - product development” we should be aware that **ERC and MCA** have helped to elevate the level of curiosity-driven scientific research across Europe without any thematic strings attached; this approach – of fundamental importance for the strengthening of the ERA - **must be further strengthened**.

- While under FP7 the beneficiaries of these blue-sky schemes were largely individuals, **similar schemes should now also be developed for collaborative research networks** of junior and senior researchers and in different sectors of the R&D world.
- Altogether, however, **curiosity-driven research should be limited to 30%** of the total budget, envisaged in this paper as **100 Bio.€** for a 5-year CSFRI (including a doubling of the current budget to ca. 3,5 Bio. € per annum for “classic” ERC funding (individuals excellence), plus, initially, 1 Bio. € for the most excellent curiosity-driven collaborative research networks without any request for pre-alignment with any of the Grand Challenges or other thematic priorities.
- MCA-linked tools are not considered here, because they currently reside in DG EAC, but it goes without saying that all components – including the more recently introduced ones that encourage cross-sectoral mobility – deserve further strengthening. In particular, however, the returnee components must be strengthened to counter the difficulties created by brain drain in some parts of Europe and the world.

By the same token, **70% of the CSFRI budget (or: 80 Bio. € over 5 years)** should be **dedicated to agenda-driven research**.

In many **fields where new challenges have been identified** (e.g.: obesity), a visibly **higher level of basic research must be present as the core of agenda-driven programmes**, whereas “old problems” – such as demographic change – have already accumulated a great deal of fundamental research data, and are much closer to entering the phase of offering input to social innovation (e.g.: social care; intergenerational justice; redesign of pension schemes; age-specific marketing etc.).

For example: the political and institutional diversity of Europe (inside and outside the EU) presents itself as a “social laboratory” from which comparative SSH research – if adequately integrated into all Grand Challenges - will be able to generate numerous insights into alternative pathways to tackle close-to-identical problems. Much of this research (especially in the SSH fields) is, however, still carried out at national level (both as part of blue-sky and as targeted and commissioned research), and often lacks the dimension of international comparison (or, indeed, international applicability). It would therefore be wise to consider specific low-barrier measures to ensure easy establishment of exchange and collaboration with research conducted thanks to support other than from EC programmes: a moderate fund should be included in every “Grand Challenge” (or JPI etc.) to liaise early on with related projects elsewhere.

Whatever the balance will eventually look like, **excellence should remain the main selection criterion** for both curiosity- and agenda-driven proposals – though excellence must **include, for agenda-driven research, a clear justification in terms of the intended impact**. Indeed, while scientific excellence (track record and originality) is the key criterion for blue-sky projects, societal impact (along the lines of the Challenge posed) would have to be factored into the assessment of projects applying under agenda-driven research programmes. This would imply that social and economic impact should feature throughout the development of a given programme, the design and evaluation of the project, all the way to the delivery and ex-post evaluation.

10. More room for bottom-up activities:

If it is acknowledged that **blue sky research is the basis for the quest for inventions and innovations**, sufficient support for “bottom-up activities” will become even more important in the future “Innovation Union”.

For this reason, all large-scale programmes (JPIs etc.) that seek to find innovative solutions to “Grand Challenges” should include substantial funding for freely chosen basic research under the overarching theme. The detailed small scale calls of FP7 are unsuitable for this approach.

Blue-sky oriented ERC (excellence) and MCA (mobility) funding streams have both given undeniably positive impulses to the identification of excellence at a European level. Both are at present mainly oriented towards individuals, and while funding for this “classic” component should be doubled based on funding for the last year of FP7, support should also be created at the level of 1 Bio. € for curiosity-driven research collaboration networks without any requirement for alignment with any of the Grand Challenges.

Bottom-up FET-Open activities for multidisciplinary teams in strategic areas should also be expanded beyond the testing ground in the ICT domain.

Altogether, curiosity-driven research should be limited to 30% of the total CSFRI budget, envisaged as 100 Bio. € for a 5-year period .

It might be appropriate to reintroduce the **European research conferences**, originally intended for the creation of networks among young researchers, as a open-to-all tool to build and sustain new networks. The **management of the scheme itself should be given to an external agency** (as has been done for the COST Actions). Such an activity should be designed so that it would **bring together academic and non-academic researchers and stakeholders** (which for the sciences would principally mean private sector stakeholders and researchers, while the SSH fields could target practitioners from, for example, public administrations, the creative industries, social security and policy institutions etc.).

11. EU R&I funding to support policy-making and forward-looking activities:

Evidence-based policy-making relies on complex, multi-layered, often longitudinal datasets, that are costly and time-consuming to collect and to update. There is no such thing as instant expertise. Many of the datasets have to be global in nature to be meaningful, and **need long-term commitments for collection and curation** (e.g.: public health; finance; meteorology; changing values). For most fields, the design of the intended evidence-base and the interpretation of the data collected require input from a variety of scientific disciplines, including, typically, SSH experts.

It is very **important that such datasets are not left at the mercy of short-lived “projectification”**, but that they are included in the strategic decisions on societal grand challenges.

Verifiable plans for data curation and sustainability must be part of all projects under “Grand Challenge” themes, and an extra effort must be made as part of these programmes to mutually connect existing datasets at national or other levels; wherever appropriate and necessary, this **mutual opening of datasets should be taken forward also at the global level.**

In terms of the new global positioning of a **European foreign and development policy**, it will be important that **specific expertise in area studies** is strengthened throughout

the continent; as part of the 6th challenge proposed by ALLEA (which corresponds broadly to the fields of SSH) support is to be given to institutions and funders that propose a collective strengthening, networking and profiling of the area studies expertise throughout Europe; **European research centres abroad** (see above).

Academies are typically engaged in the identification of scientific elements for foresight analysis and planning at national level (typically commissioned) while at European level the network of academy members, **EASAC, provides reports on scientific themes of relevance for policy-makers**. Both lines of effort could be usefully combined with the foresighting networks that have emerged around the JRC's IPTS in Seville.

12. Role of the JRC in supporting policy-making and forward-looking activities:

JRC institutes and units are an important – in areas related to metrology and standardisation perhaps even critical – addition to the institutional research landscape in Europe. Some argue, it **should gain in stature** and become, in certain areas at least, the equivalent of the US-American National Institute of Standards and Technology (NIST).

The JRC thematic structure is already partly **pre-figuring the strategic thematic choices** that will be made under the CSFRI.

The JRC's IPTS has been working increasingly as the **hub of a number of national and international foresight and policy advice centres**.

In many national contexts it might help the standing of national institutes vis-à-vis their respective governments if they were seen more closely allied with the IPTS; joint sessions with politicians and for the media might help to achieve this.

Cooperation of the JRC institutes with national institutes is also of importance beyond the task of foresight (i.e. the early identification of problematic developments relevant to the environment and society), especially when it leads to proposals and preparations of options for political action.

The JRC's overall approach for lending **support to the integration of new MS and candidate and ENP countries** is particularly welcome.

13. EU R&I activities and the interest / involvement of citizens and civil society:

Science Education

As stated above, a **rejuvenated creativity-oriented and inquiry based STEM education** is one of the key tools for fostering interest in science, research, discoveries and the social impact of an innovation policy among citizens and civil society. As demonstrated by many studies, early education, especially in science, is critical for shaping a long-term interest in science. The role of parents, and especially of mothers, in the career plans of children is equally critical. In addition, more and more teachers are female, and their interest – or lack of interest – in S&T subjects and concepts can be a significant factor in career choices made by girls. Some argue that a science education curriculum that would create better connections between school topics and societal issues may also help to modify girls' current view of science.

Involving the local communities in science education projects has already demonstrated its positive impact on the whole local civil society (e.g. school science projects, contests, etc.). Between DG R&I, EAC and, possibly, others, **new methods for stimulating interest in science education should be supported (pilot projects etc.)**.

We offer here a number of more further aspects to be considered that refer to the broader responsibility for educating a STEM literate citizenry:

- Critical for the engagement of a society with innovative products and services and the related choices (be it with regard to climate, energy, food, health, media, transport or well-being) is familiarity with core concepts and ideas of the STEM fields: while education will remain an area determined by the principle of subsidiarity, **EC support** through a variety of DG's (R&I; EAC; INFSO etc.) can help foster a **learning culture that incorporates the (scientific and) technological basis of all human societies**, but in particular of contemporary and future societies.
- Support for exploratory research into (and, perhaps, even experimental roll-out phases of) efforts at rejuvenating curricula will still be necessary;
- An understanding of core business, entrepreneurial, finance and commercial concepts, practices and rules might also be integrated into curricula alongside the classical scientific and humanistic disciplines.
- EC sponsored **Life-Long Learning programmes** should include exposure to scientific and technological advances that have emerged from EC-related funding.

Research integrity and trust

Much of the positive engagement of society with science, technology and innovation depends crucially on the **trust of the citizenry in the integrity and independence of the scientific enterprise**. This may even gain in urgency with the strong encouragement that public-private partnerships are expected to receive as part of the boost to be given to cutting-edge R&I investments.

Special attention to this needs to be paid in **collaborative research projects that involve fieldwork in countries subjected to less strict ethical rules** – notably when for-profit partners are involved.

The inclusion of the **Code of Conduct for Research Integrity – developed jointly by ALLEA and ESF** – among the documents which future EC applications would be expected to sign up to, would be a welcome signal. Similarly, ethics training modules should be included in projects and programmes that include doctoral training on a larger scale.

Responsible conduct of science

By the same token, the imperative of creating better evidence for policies that aim at creating more inclusive and just European and global societies under the Vision Europe 2020 will entail an increased volume of research on and with vulnerable sectors of the population (such as children; prisoners; minorities; people affected by communicable diseases; political opposition in authoritarian regimes etc.etc.). Current evaluation forms that seek to ascertain whether all measures have been taken to conduct ethically sound research do not cover the area of **personal data protection, privacy and data storage** sufficiently well and will need to be improved.

While the ethics review of successful project applications is beginning to be seen as more than a formality, the relative importance of **studies on ethical, legal and societal impact as part of CSFRI projects** should be expanded; this should take the form not of quotas of funding, but of real research components.

Involvement of Civil Society Organisations

As part of the more explicitly strategic choice that will be made under the CSFRI, we shall necessarily also see **more involvement of non-academic stakeholders from**

CSO's and user-groups in programme design and execution (incl. public authorities as possible end-users); their role will be more than merely being recipients of products under a detailed dissemination that may be developed by programmes and projects as part of their funding contract.

At the level of funding, continued funding of science and society activities at European level will be necessary; especially support for the **presence of science topics in the traditional and the emerging media would be welcome.**

Strengthening competitiveness

14. How to take account of the broad nature of innovation (non-technological innovation, eco-innovation, social innovation)

The Green Paper is vague in its definition of “innovation”. The holistic approach to the notion of “innovation” argued in the introduction is considered necessary for tackling societal challenges. Some specific comments may be useful nonetheless on where steps beyond the currently privileged narrow and linear model of “innovation” can be made.

- Significant results can be expected from investments in **non-technological innovation, in design, process innovation and marketing** (all areas in which arts and social sciences are of crucial importance);
- The availability of the current tools available under CIP (eco-innovation: pilot and market replicators) should be accessible more widely; they could be developed into a more generalised post-research market-entry tool, perhaps in combination with public procurement measures;
- Such aspects as have been listed above ought to be reflected both in large-scale JPIs and EIPs.

Social Innovation

Perhaps the largest area for expansion clearly resides in the field of “social innovation”, which must be seen also as linked to the redefinition of European security, development and foreign policy.

- the CSFRI needs to give a certain **centrality to the concept of “social innovation”**; for this, involvement of experts for the development and deployment of cultural and societal knowledge is essential;
- Funding instruments should **facilitate the participation of not-for-profit CSOs**, by allowing them access to funding for 100% of their eligible costs (the rules for their participation was modelled on a funding scheme originally meant for SMEs – further evidence that mechanical simplification and harmonisation can create rather than reduce barriers);
- Part of the effort invested in identifying opportunities for social innovation should aim at enhancing societies’ ability to engage with other (technological and non-technological) innovation processes: so far, numerous institutional bottlenecks have prevented Europe from developing innovation-friendly cultures. If Europe and its institutions are to promote innovation, they need themselves to innovate . This focus on research on and research leading towards “social innovation” should constitute about 1/3 of an expanded budget of the SSH sub-programme (3 Bio. € over a 5-year period).

15. Industrial participation in EU R&I programmes (JTI's; PPP's; role of ETP's)

A major obstacle – for private industry and public research institutions alike – is the often less than reliable commitment – political, but especially financial - of MS and others to the new instruments that require multi-resourced funding.

IPR and publication regimes – while being subject to rules of publicly funded research and therefore privileging the public sector – **must also show some flexibility.**

Since complaints about the multiplicity (and incoherence) of funding programmes seem to be coming more from industry than from Academia – industry having access to funding schemes also from other DGs and, generally, showing a degree of disenchantment with public sector rules, even when funded by the public sector - a **comprehensive evaluation of the success and impact of the many programmes, initiatives and platforms** with a potential to attract private industry R&D units (ETP's, JTI's, EIP's, Art.169&171, to name but a few) should be the basis for any decisions for CSFRI.

Profiles might be strengthened or new ones might emerge when ETP's could function as platform to establish a (regional, Europe- or worldwide) strategic plan for a given field, for which it could then function also as a coordination council.

By the same token it would also be desirable to **consider and compare the respective impacts of existing national and regional programmes, and to explore possibilities of closer cooperation and coordination.** This holds true in particular for support measures for the benefit of SMEs, where a degree of decentralisation might reduce barriers to access.

There seems to be consensus that the RSFF is a tool of great value in particular for the early stages of industry-based innovation processes.

16. What and how best to support SMEs; how to complement national and regional schemes?

SMEs – but also public sector research institutes and larger corporations – should be **attracted to programmes wherever they are at the forefront of innovation.**

SMEs in particular are currently targeted through both FP and CIP, and the future CSFRI may offer an opportunity to successfully streamline the support offered to them.

SME specific programmes may be helpful, especially if they are well **aligned with and complement existing national and regional programmes, which often combine direct support with indirect incentives, such as tax credits.**

Against the background of the holistic approach to innovation here advocated care should be taken that in the future CSFRI conditions for participation are targeted at CSOs and that they take into account their generally not-for-profit status.

Remnants of the original for-profit SME-centred regulations that still hamper the full participation of CSO's should be abandoned.

17. Open, light and fast implementation schemes building on the current FET actions and CIP eco-innovation market replication projects) to allow flexible exploration and commercialisation of novel ideas.

As mentioned above, ALLEA appreciates the positive experiences that have been made with the FET and CIP schemes. An **analysis of the need for post-research / pre-market support should be the basis for further expansion of the tools** developed under the CIP (“eco-innovation”), such as funding for proof of concept or demonstrations with potential future users.

FET is seen as a good addition of the portfolio of funding instruments: it has simple procedures, allows for a bottom-up approach, and is with its relatively small scale a good entry level for close PP-cooperation, which could serve as an **exploratory mechanism throughout all thematic areas** (not only in ICT).

Here as in the larger scale EIPs it would be desirable to have complete openness of the funding tools, including for industry actors from ICPCs in partnership with European applicants.

Throughout the funding portfolio care should be taken to include to **make easily accessible support for transitions / knowledge transfer from the academic to the SME/industrial sector** (perhaps modelled on the proof of concept / enabling grants recently developed for ERC grantees).

18. EU-level financial instruments (equity and debt based):

The good uptake of the RSFF and of the financial aid under CIP clearly demonstrate the need for more financial tools for R&I. History will tell whether the availability of the jointly developed resources (EU with EIBG) helped to prevent the exacerbated imperfections of the slow credit market and the even less developed venture capital market in Europe. It seems perfectly adequate to provide such finance as amply as required according to best accounting standards.

Specific lending mechanisms for SMEs, perhaps also for some research infrastructures, could be developed.

Experiences from certain of the CEE countries show that **special efforts may need to be made to ensure that equitable access is guaranteed across the Union and beyond**.

For many reasons it might be a good idea to detach such loan-based financial instruments from the CSFRI proper, and to leave its administration entirely in the hands of the EIB. The vitality of European SMEs in the innovation sectors might be further helped by appropriate revisions of the State Aid Framework for Research and Development and Innovation. Probably the **objective should be generalised support across all sectors of the future CSFRI, with availability for follow-on assistance being subject merely to merit**.

19. New approaches to supporting R&I, such as public procurement (incl. rules on pre-commercial procurement) and/or inducement prizes:

Pre-commercial public procurement is a good means of accelerating quasi-market entry for innovative products and services. With public procurement amounting to 16-17% of the European Union’s GDP, the scale and scope of this form of post-research support is immense. As far as is possible existing tools and regulations should be adapted to make use of this option.

20. IP rules and the balance between competitiveness and the need for access to and dissemination of scientific results:

In Europe, the European Patent Convention of 1973 was a major step forward, but scoreboard analyses show that high translation and litigation costs continue to place European actors at a significant disadvantage compared to US and Asian competitors. Hence, it should be a prioritized task for the European authorities to improve the patent system in Europe. The **CSFRI should be underpinned by an appropriate framework for IPR and patenting in Europe**. The patenting of inventions derived from the research supported by EC funding should be as simple and fair as possible.

Community Patent

The **establishment of a single Community Patent**, valid across the entire EU with an associated legal framework, would be an important element. The current system which requires separate registration in each MS, even when validated by the European Patent Office, is cumbersome and very expensive compared to the situation obtaining in other leading economies like Japan and the USA, where the *Bayh-Dole Act* explicitly allows universities and other research institutions to retain intellectual property rights based on publicly funded research ever since 1980. This and other legislative initiatives aimed at the protection and dissemination of research results have made US academic institutions important participants in the innovation process.

ALLEA recognizes that the establishment of a unitary patent system would also represent a significant step forward for patenting within the academic sector, but notes that further improvements are needed in order to make the patent system better suited for this sector – and also for SMEs - , allowing researchers and their institutions full rights to exploit any invention derived from research funded by the Commission.

Grace Period

The EC should **re-launch efforts aimed at ensuring that European law provides for a “grace period” similar to the one existing under US law, but preceding the Union priority date**. This will reduce the risk of accidentally depriving scientists and their institutions of the chance to acquire patent protection (since important results of research have to be held back if and until a patent application is filed, and publication would make the application invalid), while at the same time facilitating early publication and dissemination of research results. Without the introduction of a grace period into European law, the U.S. are unlikely to bring their law in line with the law of the rest of the world, and in particular to give up their first-to-invent system

The rights and obligations of researchers, institutions and industry partners vary between the Member States, and are to some extent insufficiently clarified. In view of increased PPP's it should be investigated whether harmonization is possible and needed with respect to, in particular, the right to apply for patents and the entitlement to remuneration for inventions that are assigned from researchers to institutions or industry partners.

Statutory framework

European law does not provide a **statutory framework enabling universities and other publicly funded research institutions effectively to exploit and protect their research results**. The need for a harmonized framework and the possible structure and content of such a framework, in particular with respect to results that emerge from public-private partnerships, could be further explored by the ALLEA Standing Committee on Intellectual Property Rights in cooperation with the Member Academies and related scientific organisations.

Open Access

In order for the community to get maximum benefit from the research it funds, the results must be disseminated widely. The **EC might insist that publications derived from its support should be made "Open Access" (following the recommendations of the current pilots and observatories**, provided they are in line with rules and regulations applying to all partners) and funds should be provided in the grants to make this possible. However, a debate is still needed as to whether regulations should be phrased in such a way that such access is encouraged and **incentivised rather than being made obligatory, since some consortia with private industries might be rendered unsustainable by rules that are too strict in this respect.**

Strengthening Europe's science base and the European Research Area

21. Strengthening the ERC:

The **ERC** has been perhaps the **single most important addition to the funding portfolio of the EC under FP7**. It has been a **major success** both politically and scientifically (how to recognise excellence at European level). The recent review has helped to further improve the support structures and procedures.

ALLEA would strongly oppose any suggestion that the ERC could be discontinued after FP7; indeed, **its budget should be at least doubled to min. 3.5 Bio. € per annum for the individual grants.**

For the future it will be important to explore how the ERC can **also support excellent collaborative research networks**; the experience with the individual grants has demonstrated that one could start with a **small budget of 1 Bio. € per annum.**

It is encouraging that the ERC has also contributed to a better understanding of the fact that **curiosity-driven research is the basis**, possibly the starting point, for what can be defined as innovation. **We cannot expect innovative solutions without a willingness to invest in unconventional high-risk research.** This exclusive focus on curiosity-driven, blue-sky research must remain the characteristic of the ERC, though there is no objection to offering support to transmitting knowledge from the laboratory to the market (additional proof-of-concept grants).

The ERC also demonstrates that **excellence is to be found in all domains**. But since **frontier science is shifting** and blurring boundaries between traditional fields, this advancement of knowledge **must be reflected in a regularly updated composition of scientific bodies at all levels** (council to evaluation panels).

However, at the operational level, there is still considerable concern about truly **interdisciplinary projects not being properly covered in the panels**. Part of the problem may be the sets of indicators chosen, which should also be subjected to regular revisions.

Pending an expansion of the percentage of winning proposals allocated to the interdisciplinary panels, the current distribution of winning proposals between natural, life and social/human sciences should be continued.

Some proposals about making wider parts of Europe benefit from the ERC have been made above: an **EC top-up could be offered to those selected, but unfunded, ERC candidates in countries that are underrepresented, to whom their national funder would offer support for their ERC project.**

The ERC should also be a **tool for attracting to Europe the best researchers from around the globe**. It seems that **extra efforts need to be made** in that respect. Some alignment of institutional marketing and promotion of the ERC grant opportunities might create a new group of multipliers abroad.

22. How should EU support assist Member States in building up excellence?

A variety of tools have been used and will have to be used (networking support; glue money for collaborative research; mobility; institutional reform etc.).

In general, while aware of the problematic nature of combining excellence and cohesion objectives in EC funding, ALLEA argues that a very **substantial part of the future cohesion funds (100 Bio. € over 5 years) should be explicitly directed towards evening out some of the glaring discrepancies between different European regions in their R&I capabilities**.

In matching the CSFRI funds (100 Bio. € to stimulate excellence) this second set of 100 Bio. € will help over the 5-year period under discussion to make progress on key Europe 2020 objectives: the future cohesion fund will have a special responsibility for promoting the further sustainability of Europe-wide innovation investments and policies through smart specialisation approaches.

Elsewhere we have pointed to **specific areas of investment (research infrastructures; regionally specific grand challenges; cross-border clustering**, incl. staff exchange; co-funding arrangements for ERC projects in countries underrepresented among the awardees; **capacity building** in management and higher education institutions).

Some of the more recent accession countries see great benefit in increased and continued production of best practice material by DG R&I, since such material is likely to assist the reform of domestic institutions as well, equipping them better, in the process, for European and global competition.

23. Strengthening Marie Curie Actions (promoting researcher mobility and career development):

MCAs are undeniably one of the most important EU instrument supporting excellence and **contributing to human capital development**. The scheme is to be praised for its openness in terms of fields and disciplines: this is an asset that should not be abandoned. There is a good case for enhancing funding and further **expanding the scheme**.

The following are some of the considerations that have emerged from debates among the Academies:

- In order to compensate for risks such as brain drain, the **returnee components** for young researchers **should be strengthened** (special measures may be needed for enlargement countries, but also for neighbourhood countries; co-funding and strengthening of national returnee programmes might be one way to make progress);
- **Mobility in Europe should be offered also to senior researchers**, not only to young researchers (one could think about competitively awarded sabbatical grants or temporary MC-professorships);
- MCAs should be expanded to also include **mobility and training for tertiary educated technical staff of European research infrastructures** (including

- traditional infrastructures in the SSH, such as archives, libraries and museums); **top managing personnel** should also be included in this scheme;
- Cross-sectoral mobility should also be supported (including for senior researchers); offers should also extend to public sector administration and to cultural institutions;
 - Plans to **require a year in business** as well as in academia should be phrased in such a way that SSH fields are not discriminated against, for example by **expanding the non-academic experience to cultural institutions, civil society organisations etc.**; this may require some immediate changes to the APP scheme;
 - Lifelong learning and career development programmes with mobility component should be better coordinated across the directorates;
 - The successful co-funding of nationally, regionally and locally funded MCA-like grants under the **CO-FUND scheme** should be continued and **be given a longer-term perspective**;
 - In terms of overcoming cultural obstacles to the growth, sustainability and cohesion of the ERA, a mobility and career development programme should be set up to allow staff members of national funding agencies to spend time at a partner agency elsewhere;
 - **MCA components should be included in “international projects”** (former INCO-projects / SICA).

The academic community continues to be concerned about the **relocation of MCAs to DG EAC**: doctoral training and career development should be seen as integral parts of a S&T and scholarly career; wherever and however appropriate, the **closest possible coordination between the two directorates should be aimed for**. The situation should be carefully monitored and a separate evaluation on possible needs for improvements should be considered in time for changes to be made under CSFRI if necessary.

By the same token, **both directorates should work together to improve the situation for mobile researchers** (and others) in terms of **tax, pension, social security** etc. Existing barriers should be removed, and MCA could offer **awards for hosting institutions that are best able to offer good conditions for combining career and family life**.

24. What actions should be taken at EU level to further strengthen the role of women in science and innovation?

As mentioned above, early exposure to elements of **inquiry-based STEM education** is one of the keys for unlocking an interest in science. As demonstrated by many studies, early education, especially in science, is critical for shaping a long-term interest in the field. **The role of mothers** in defining whether science is included in their children's career plans is equal in importance to that **of teachers** – more and more frequently female, also in the sciences. - are female. As **role models**, their interest – or lack of interest – in S&T subjects and concepts **can be a significant factor in career choices** made by girls. Some argue that a science education that would create better connections between school topics and societal issues may also help to modify girls' current view of science. Between DG R&I and EAC new methods for stimulating interest in science education should be supported (pilot projects; teaching tools etc.), with a special emphasis on attracting girls. It will be equally important to update the knowledge of female science teachers who can operate as role models.

Some ALLEA Member Academies also use young female scientists of their **Young Academies** as role models in their interaction with primarily and secondary schools.

Gender awareness of research questions should be required under all calls, wherever appropriate.

Practical issues such as a strong child-care system and offers for dual careers are still key attention points in many countries. Here, a series of annual awards may trigger some competition and better visibility for good practice.

The activities of the Helsinki group should be reflected more in the EC's R&I funding schemes. In fact, gender mainstreaming in R&I projects will be a key aspect in the future.

25. Research infrastructures (including EU-wide e-Infrastructures):

ALLEA is a participant in the high-level stakeholder group that is discussing the future of RIs in Europe. A number of issues have been identified on which these organisations and the EC will work together to tackle the main **challenges related to the governance and operation of research infrastructures**, in order to fulfil the objectives of the Europe 2020 Innovation Union initiative. These issues relate to:

- Developing a common approach for the **evaluation** of RIs (including e-Infrastructures) at national or European level (based on excellence, management, impacts);
- Development of **coherent** projects and initiatives on the basis of **national and European priorities** for world-class quality research infrastructures and research services;
- Identifying and promoting **best practice for RI governance**, including cost control and long-term sustainability of resources;
- Attraction of human resources, notably of high quality technical, engineering and managerial staff, and support for their training and mobility;
- Promoting best practice for the optimal use of RIs by the research community, and for implementation of **open access policies ensuring scientific excellence**;
- Improved interactions between the RI providers and the user communities, including industry as user and supplier, to fuel the **research-innovation cycle**;
- Increased development and use of e-infrastructures as building blocks of pan-European RIs, in particular to improve access, availability and archiving of data as well as to build virtual research communities.

In addition, a number of issues have been identified as needing more attention under the CSFRI :

- Continued glue money necessary for developing RIs (not just for the feasibility study), especially as incentive for MS to pool resources;
- Continued **involvement of scientific leaders in the development of the scientific focus** and in the selection of the best projects (open, transnational access as principle!);
- Continued revisions and improvements of the ERIC legal framework;
- More efforts for **networking (and linking to ESFRI roadmap projects) smaller national and regional facilities**;
- **Closer coordination with global activities** and with RIs outside of Europe (especially where RIs are related to global grand challenges, and where interdisciplinary research is needed);
- More attention to needs of SMEs and other private sector companies.

More attention should be given to the **coordination of research infrastructures in the SSH with digitisation projects**, that are often labelled as “cultural heritage”. This may require better cross-directorate **coordination with DG EAC and INFSO, but also with** the multitude of national and local, as well as, increasingly, **private initiatives** to digitise source material.

While more efforts should be made to involve the scientific community in the design of the research tools that Research Infrastructures can also produce, EC funding should make it easier for researchers to deposit their data in certified repositories (and be granted the resources to do so).

26. International cooperation with non-EU countries (e.g.: priority areas of strategic interest, instruments, reciprocity (including on IPR aspects) or cooperation with MS)?

The **mainstreaming of the INCO/SICA programmes is a very welcome development**. As yet, the participation of MS in programmes that invite specifically global cooperation is very uneven. Special effort may need to be made to address this issue.

More specifically:

- A **focus on priority areas** of Vision Europe 2020 will be necessary; it is important not to overlook the policy needs of the new EU foreign action and development plan; an emphasis should therefore be placed on strengthening and improving the networking of area studies competence across the continent and beyond;
- DG R&I should explore with its national partners whether **global ERA-Nets** can be launched under CSFRI;
- **International cooperation** should be stimulated in particular **surrounding large Research Infrastructures**;
- **DG R&I and Dev should work together** to develop a more ambitious set of joint research programmes **related to Grand Challenges, but seen through the lens of poverty eradication**;
- DG R&I might consider an action parallel to and building on the ErasmusMundus programmes but encouraging **senior staff exchanges**, aimed at stimulating and strengthening potential contacts for global research collaboration;
- Wherever reciprocity rules still apply, they should be reformulated in such a way that participation is made easier by lowering the percentages requested from consortium partners in countries with lower GDP.

At a more delicate and diplomatic level, EC (foreign action) interventions would be helpful in terms of establishing clear guidelines for the implementation of existing and evolving rules on scientific visas.

Also, EC embassies should fulfil a role in promoting the R&I environments of smaller MS that do not have diplomatic missions in all countries.

Earmarked resources should be set aside cross the portfolio for the **closer cooperation with candidate, ENP and Union for Mediterranean countries**.

27. Which key issues and obstacles concerning the ERA should EU funding instruments seek to overcome, and which should be addressed by other (e.g. legislative) measures?

Continued efforts must be made to better integrate the different streams of support for research leading towards the achievement of the Vision Europe 2020. This would include much **better cross-directorate coordination**, a degree of coordination between CSFRI and the future cohesion fund, etc.; cross-referencing of potentially related and complementary funding opportunities should be the rule, not the exception.

The redesign of the funding schemes (FP, CIP, SF, etc.) should be **informed by a comprehensive evaluation of innovation related issues, applied to all directorates and their programmes**; the current system of sectoral evaluations even within DG R&I (FP separate from CIP separate from EIT etc.) is not conducive to the kind of comprehensive rethinking that is necessary; **evaluation criteria** must be discussed **in view of the objectives** of the intended structural changes, and **not rely automatically on the datasets already available**; the evaluation should take the form of **indicator-informed peer review, involving academic, HE, industry, SME, and civil society actors, as well as** panel members capable of reflecting points of view from the **non-European OECD**, and the non-European G20 and non-G20 ICPC countries.

While ALLEA welcomes the importance given to administrative simplification and, to some extent, harmonisation across funding instruments, this should not be at the expense of the **flexibility in the system for developing tailor-made tools to respond to emerging new needs or opportunities**.

Major efforts will still have to be made to reduce negative effects of mobility for researchers – but also all other actors related to the innovation systems; **mobility should enrich careers not lead to personal losses** caused by the incompatibility of **tax regimes, pension schemes, and social security** provisions; in the same context, **mobility should be stimulated and supported throughout the entire research careers, as well as** for technical and managerial staff in the science system (e.g.: research infrastructures; funding agencies).

Special support should be made available for individual MS, candidate and neighbourhood countries where public sector research organisations have undertaken **ambitious reform programmes**, that aim at equipping them better for alignment with and competition under the research programmes that **seek to follow the Vision Europe 2020 agenda**.

The **participation of SME's** should be stimulated by appropriate modification of the rules and regulations; by the same token, some new thinking may be necessary to ensure appropriate forms of interaction of public sector researchers with the **large corporations** and their research-intensive branches;

In response to the importance of “social innovation”, **barriers to entry for CSO's should be lowered**, and evaluation criteria should be expanded in such a way that their contribution can be accurately captured (as added value, not as requirement);

Future work-programmes that aim to respond to **Grand Challenges** should be examined with regard to the possibility of launching **sub-programmes of relevance** (not “case studies”) **for regions of Europe and ENP countries** (including: Western Balkans, CIS

states, Southern and Eastern Mediterranean), but **also, as part of the global positioning** of the ERA, worldwide;

Special emphasis will have to be given, under the CSFRI, to the research demands that a **new European foreign and development action** will create. This will involve a **closer alignment with DG Dev** and will have to include the **strengthening of area studies expertise in Europe**. One may also consider the **establishment of European research centres abroad**: these could build by initially by supporting and networking the national and nationally funded research centres and antennas, showcasing the diversity and opportunities of Europe as a globally competitive growth and innovation region.

By the same token, a more level playing field in terms of representation of the national science systems outside the EU should be aimed for. Not all MS have diplomatic missions in all countries of the world, and in view of attracting a more diverse population of students and researchers **better information facilities for smaller MS** should be made **available through the diplomatic missions of the EU**.

Special efforts will be necessary to support and **expand a harmonised and generous implementation of the scientific visa regime** to enhance the centrality of Europe as an attractive locale for scientific exchanges and the acquisition of specific scientific expertise; this **requires very close cooperation with the diplomatic services of MS**; for cases in doubt, science organisations such as Academies, provided that they are given the resources to do so, could help to ascertain the bona fide status of scholars as part of their responsibility to ensure the freedom of science and scientists;

Given that basic and blue-sky research is the foundation for a successful innovation system and given further that the pursuit of break-through discoveries requires patience and serendipity, it would be appropriate to have, **alongside the short-term Europe 2020 horizon also a medium and longer-term visions based on the best possible future scenarios** and benefitting from the **input of the top-scholars and scientists as well as CSO's**; this seems to be the only way for the governance structure that the EU institutions are to provide for the "Innovation Union" to develop the same level of strategic forward planning that major corporations have been developing over the decades. If successful in design and political follow-up, this will also be a way to rebuild, in the eyes of the European citizens, the legitimacy of the European project.

Closing questions

Other ideas important for future EU research and innovation funding that are not covered in the Green Paper:

Given that many of the changes considered necessary for the Innovation Union to become a reality will restructure the HE and research environment of the next generation of researchers, it seems advisable to **include early and mid-career researchers, their concerns and visions, in all relevant reflection groups** on the future of the European science system. For such form of policy engagement, ALLEA and several of its Member **Academies have experimented successfully with the format of Young Academies**, and would be willing to share their experiences.

The restructuring of current and new components of the future CSFRI and the intended **improved coordination of CSFRI and large programmes of other directorates** (such

as the future cohesion fund) should **lead to a revision of the existing FP governance system (programme committee)**. Level and rhythm of decision-making, function of oversight and format and scope of evaluation will need to be reconfigured to ensure appropriate control and buy-in of MS. This should be linked to a requirement also to ensure better coordination with complementary actions at national level.

The increasing Euro-scepticism among wide sectors of European societies (which seems to be a corollary of a spreading scepticism towards the ability of traditional political structures to tackle the “Grand Challenges”) must not be allowed to spill-over into and affect European funding for research and higher education. A very large-scale **European research programme on identity and cultural change, education and employment, intergenerational justice and personal and societal well-being** (part of the 6th challenge), with strong involvement of non-academic societal actors, may help to stem the recent tide of disinformation, and to embed the notion of a Europe-wide social market economy for the 21st century. Beyond this, however, all efforts must be made to demonstrate the true added value of research at European level for the well-being of European and global societies, not only in terms of macroeconomic indicators, but also in terms of standards of sustainability, innovative products, societal impact, social and global justice, and democratic rights.

Education, science and scholarship, basic and applied research and technological and non-technological innovation are all linked in complex ways; if properly funded, they together can provide the fuel for the progress of Europe and its constituent societies towards the “Innovation Union” of the 21st century.

List of abbreviations

| | |
|-----------|--|
| ALLEA | - ALL European Academies |
| CAP | - Common Agricultural Policy |
| CEE | - Central and Eastern Europe(an) |
| CIP | - Competitiveness and Innovation Framework Programme |
| CIS | - Commonwealth of Independent States |
| CO-FUND | - Marie Curie Actions: Co-funding of regional, national and international programmes |
| COST | - European Cooperation in Science and Technology |
| CSFRI | - Common Strategic Framework for future EU Research and Innovation Funding |
| CSO | - Civil Society Organisation |
| DG Dev | - Directorate General Development (Europe Aid, Development and Cooperation) |
| DG EAC | - Directorate-General for Education and Culture |
| DG INFSO | - Directorate-General Information Society and Media |
| DG R&I | - Directorate-General for Research and innovation |
| EASAC | - European Academies Science Advisory Council |
| EC | - European Commission |
| EHE/R/IA | - European Higher Education / Research / Innovation Area |
| EIB(G) | - European Investment Bank (Group) |
| EIP | - European Innovation Partnerships |
| EIT | - European Institute of Innovation and Technology (EIT) |
| ENP | - European Neighbourhood Policy |
| EP | - European Parliament |
| ERA | - European Research Area |
| ERAB | - European Research Area Board |
| ERA-Nets | - European Research Area Networks |
| ERIC | - European Research Infrastructure Consortium |
| ESF | - European Science Foundation |
| ETP | - European Technology Platforms |
| EU | - European Union |
| EUROCORES | - European Science Foundation Collaborative Research Scheme |
| FET | - Future and Emerging Technologies |
| FP | - Framework Programme |
| GDP | - Gross domestic product |
| GMO | - Genetically modified organism(s) |
| G20 | - Group of Twenty (AR, AU, BR, CA, CN, DE, EU, FR, IN, ID, IT, JP, KR, KS, MX, TK, UK, US, RU, ZA) |
| HE | - Higher Education |
| KIC | - Knowledge and Innovation Communities (see also: EIT) |
| IAPP | - Marie Curie Industry-Academia Partnerships and Pathways |
| ICPC | - International Cooperation Partner Countries |
| I<C>T | - Information <and Communication> Technologies |
| INCO | - International Cooperation |
| IPTS | - Institute for Prospective Technological Studies |
| IPR | - Intellectual Property Rights |
| JPI | - Joint Programming Activities |
| JRC | - Joint Research Centre |
| JTI | - Joint Technology Initiatives |
| MCA | - Marie Curie Actions |

All European Academies

| | |
|-------------|--|
| MS | - Member States (of the European Union) |
| NCP | - National Contact Points |
| NETWATCH | - the EC's information platform on transnational R&D programme collaboration |
| OECD | - Organisation for Economic Co-operation and Development |
| PPP | - Public-Private Partnership |
| RFCF | - Research Fund for Coal and Steel |
| RSFF | - Risk Sharing Finance Facility |
| R&D | - Research and Development |
| R&I | - Research and Innovation |
| SET-Plan | - Strategic Energy Technology Plan |
| SICA | - Specific International Cooperation Actions |
| SME | - Small and Medium Sized Enterprises |
| SSH | - Social Sciences and Humanities |
| STEM | - Science, technology, engineering and mathematics |
| STS | - Science and Technology Studies |
| S&T | - Science and Technology |
| TTG | - Time To Grant |
| TTO(ffices) | - Technology Transfer Offices |
| US | - United States of America |

ALLEA Member Academies

Academy of Sciences of Albania

Akademia E Shkencave E Shqipërisë

Austrian Academy of Sciences

Österreichische Akademie der Wissenschaften

National Academy of Sciences of Belarus

Нацыянальная акадэмія навук Беларусі

Royal Academy of Sciences, Letters and Arts of Belgium

Académie Royale des Sciences des Lettres et des Beaux-Arts de Belgique

Royal Flemish Academy of Belgium for Science and the Arts

Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten

Academy of Science and Arts of Bosnia and Herzegovina

Akademija nauka i umjetnosti Bosne i Hercegovine

Bulgarian Academy of Sciences

Българска академия на науките

Croatian Academy of Sciences and Arts

Hrvatska Akademija Znanosti i Umjetnosti

Academy of Sciences of the Czech Republic

Akademie věd České republiky

Royal Danish Academy of Sciences and Letters

Kongelige Danske Videnskabernes Selskab

Estonian Academy of Sciences

Eesti Teaduste Akadeemia

Delegation of the Finnish Academies of Science and Letters

Suomen Tiedeakatemiain Valtuuskunta

Academy of Sciences

Académie des Sciences - Institut de France

Academy of Inscriptions and Letters

Académie des Inscriptions et Belles-Lettres

Academy of Moral and Political Sciences

Académie des Sciences Morales et Politiques

European Academy of Arts, Sciences and Humanities

(Associated Academy)

Georgian Academy of Sciences

საქართველოს მეცნიერებათა ეროვნული აკადემია

Union of the German Academies of Sciences and Humanities

Union der deutschen Akademien der Wissenschaften

Academy of Sciences of Göttingen

Akademie der Wissenschaften in Göttingen
(Associated Academy)

Academy of Sciences and Literature Mainz

Akademie der Wissenschaften und der Literatur Mainz
(Associated Academy)

Bavarian Academy of Sciences

Bayerische Akademie der Wissenschaften
(Associated Academy)

Berlin-Brandenburg Academy of Sciences and Humanities

Berlin-Brandenburgische Akademie der Wissenschaften
(Associated Academy)

Academy of Sciences at Hamburg

Akademie der Wissenschaften zu Hamburg
(Associated Academy)

Heidelberg Academy of Sciences

Heidelberger Akademie der Wissenschaften
(Associated Academy)

North-Rhine Westphalia Academy of Sciences and Letters

*Nordrhein-Westfälische Akademie der Wissenschaften und der Künste
(Associated Academy)*

Saxonian Academy of Science at Leipzig

Sächsische Akademie der Wissenschaften zu Leipzig (Associated Academy)

German Academy of Sciences 'Leopoldina'

Deutsche Akademie der Naturforscher Leopoldina

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Ακαδημία Αθηνών

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Icelandic Society of Sciences

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האקדמיה הלאומית הישראלית למדעים

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Accademia Nazionale dei Lincei

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Akademia e Shkencave dhe e Arteve e Kosovës

Latvian Academy of Sciences

Latvijas Zinātņu akadēmija

Lithuanian Academy of Sciences

Lietuvos mokslų akademijos

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Polish Academy of Sciences

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Academia Română

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Slovak Academy of Sciences

Slovenská Akadémia Vied

Slovenian Academy of Sciences and Arts

Slovenske akademije znanosti in umetnosti

Institute of Spain

Instituto de España

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