



The Swedish Royal Academy of Engineering Sciences (IVA) on the coming EU Framework Program for Research and Innovation

Summary

The Swedish Royal Academy of Engineering Sciences (IVA) considers the coming EU research and innovation framework program (FP9) to be of utmost importance for Europe's ability to meet societal challenges, contribute to scientific progress and be competitive in a more globalized world. The Academy would like to point out the following:

- For EU to remain globally competitive, it is essential to increase the **funding of FP9 well above the funding of Horizon 2020 (H2020)**. The increased funding should be made possible by changes in the priorities of the EU budget.
- FP9 must be a highly **competitive program based on excellence** in research and innovation. It should bring **European added value** and not substitute for national efforts. Well working initiatives in H2020 should be kept in FP9.
- **Simplification and streamlining efforts need to continue**. The administrative burden on participating researchers, companies and other organizations must be reduced.
- **Funding for the ERC must be increased** in FP9 to ensure that more excellent research is funded.
- **European research infrastructures need to be accessible** for all sorts of organizations. In addition, a new **European strategy for infrastructures for test and demonstration** is needed.
- **FP9 must continue to contribute** to the development of globally competitive European technology and industry at the forefront of sustainable development. **Companies of all sizes need to be able to participate** in FP9 initiatives such as for instance Public Private Partnerships and other collaborations.
- A **European Innovation Council** is an interesting concept that could complement the framework program without being a pillar on its own. Ideally, an EIC should collect, under one umbrella, all innovation promoting instruments already in place.

The Swedish Royal Academy of Engineering Sciences (IVA)

The Swedish Royal Academy of Engineering Sciences (IVA) is the world's oldest academy of Engineering Sciences. The Academy was founded in 1919 and has a mission to promote technical and economic sciences, and the development of enterprises, for the benefit of society. The academy is strongly engaged in research, education and innovation policy, and is one of few Swedish non-government organizations that works with policy issues ranging from basic research to innovation and product development. The Academy is also strongly engaged in related policy areas such as education, sustainable development and energy. IVA has approximately 1300 distinguished Swedish and foreign fellows from academia, industry and the public sector.

The coming EU framework program for research and innovation

Roles and funding levels

Europe and its member states need to have strong research and innovation systems in order to be competitive, meet societal challenges and create innovations. The framework programs have developed over time and Horizon 2020 has been a significant improvement compared to its predecessors. Hence, it is important to build further on the successful parts of Horizon 2020, rather than design a novel funding system with entirely new instruments.

EU should **not substitute** for actions that primarily are of national interest but ensure that FP9 takes advantage of the fact that all EU is to be engaged. Here efforts are needed on both national and EU levels to make sure that the systems are complementary. The coming EU framework program for research and innovation, FP9, must provide additional value that national research programs and funding mechanisms cannot achieve. Such beneficial initiatives may involve international co-operations and collaborations to meet societal and environmental challenges. An open research and innovation union where mobility is encouraged should be in focus. Furthermore, better opportunities for public private partnerships (PPP) and more accessible common research infrastructures and infrastructures for test and demonstrations would strengthen research and innovation within the EU.

As the *Lamy report*¹ states, EU investments in research and innovation are unique in “*that it fosters transnational collaboration and collaboration on a scale, scope and speed that no single country can match*”. It is therefore of utmost importance that **FP9 is a strong and competitive program** that provides support for excellent research and innovation, and contributes to European competitiveness, paradigm shifts and solutions to societal challenges. **The funding level of FP9 should at least be at the highest level being discussed**, that is close to a doubling compared to Horizon 2020 (H2020) and in the vicinity of 120 Billion Euro over seven years. The increase in funding compared to H2020 should be **accomplished by changes in the priorities of the EU budget rather than by increased funding from member states**. It is, however, essential that many member states increase their own investments in research and innovation, and that the EU as well as its member states reach the investment target of 3% of GDP as soon as possible. **Everything that FP9 supports should be of excellent quality**. Unfortunately, Horizon 2020 did not succeed to fund enough excellent project proposals due to a too low budget in a number of programs. This is unfortunate since Europe by that misses opportunities and comparative advantages that could increase the union's competitiveness as well as its impact on scientific paradigm shifts.

1

http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/hlg_2017_report.pdf

Simplification efforts must continue

Hand in hand with the increase in funding, efforts to **simplify and streamline the** processes of the framework program must continue. Over-bureaucracy, inefficient and complex processes and unnecessary controls/reports need to be avoided. While EU can and should define goals, calls and missions, it should **not prescribe how research and innovation questions are tackled. Rather it should let the project applicants propose the path forward.** This would both open up for innovative thinking and reduce the bureaucracy. Control of the progress of various projects should be limited and the system should have a stronger base in trust. **Evaluations** (see also below) of projects and entire programs are however important.

Structure and components of the program

When designing FP9 it is important to **keep well-working programs and structures from Horizon 2020.** Furthermore, while the pillar structure may work well, **horizontal integration** between the pillars is of central importance. Research and innovation processes are not in themselves linear and unnecessary barriers and divisions (e.g. basic research, applied research, innovation etc.) should be avoided. Synergies must be mapped and utilized.

To increase the quality and relevance of the program, and to ensure trust and acceptance for research as well as the program itself, participation by **citizens, organizations and other stakeholders (for instance municipalities, loose interest groups etc.)** is of high importance. Therefore, **educational efforts and citizen engagement** should be expanded in FP9 compared to in H2020. However, to ensure an effective and fruitful engagement, further discussions on this subject is recommended, for instance, concerning models for compensation of performed work.

Research

The **funding for the European Research Council (ERC) needs to be increased.** This part of the framework program, in the fundamental science pillar, should be prioritized. ERC enables Europe-wide competition and can therefore support the best science without national constraints. As in some other instruments the success-rate has been much too low and **many excellent project proposals have not been funded.** This is unfortunate and therefore more capital has to be allocated for this purpose.

Research infrastructures are of utmost importance both for research and innovation. However, the high costs for necessary infrastructures is an increasing problem for many member states. EU, together with member states, need to take responsibility for the availability of crucial and expensive research infrastructures. Infrastructures need to be openly accessible for academic researchers, enterprises and institutes. The **ESFRI Roadmap** is an excellent initiative and should be further developed to secure joint funding of major infrastructures that are relevant for high quality research in Europe. In addition, a European strategy for **test- and demonstration infrastructures** is necessary. It is important to recognize that such infrastructures are inherently different from research infrastructures but still of high importance to meet future societal and environmental challenges.

The new Missions instrument

“Missions” will be a new instrument in the upcoming framework program. The instrument promises to become an interesting new way to meet important global challenges, but more work is needed to define it. Missions should address central **long-term challenges** and should preferably be coupled to the United Nations Sustainable Development Goals (Agenda 2030²). Member states should, by a very open process, have a clear influence over which missions that

² <https://sustainabledevelopment.un.org/post2015/transformingourworld>

are defined. Obviously, stake holders and citizens should be able to influence the missions, while at the same time always ensuring high research quality. As for other instruments, missions should be **result-oriented**. Noteworthy, the organization of the work performed should largely be defined by the participants in the program. The possibility of companies to participate in missions is important, for instance through the use of public-private partnerships (PPP). When defining the instrument, and its processes, it might be of interest to use the “Challenge-driven innovation program”³ by the Swedish innovation agency Vinnova as an inspiration.

Industrial relevance

It is crucial that Europe continues to invest in major future technologies of industrial relevance to promote sustainable development for a competitive industry and to create solutions to the challenges society encounters. To decrease the focus on industry-related research would hamper European competitiveness. The collaborative, industry-focused research where large corporates, small and medium-sized enterprises (SME) and start-ups collaborate with academia and RTOs has proven to be efficient in bringing value to society and increases the global competitiveness of the EU. Bringing research results to the market and delivering impact is not a linear process with a secure outcome. Innovation involves large risk-taking and this has to be taken into account when predicting impact.

Working in PPPs towards solutions on major challenges for society and increased competitiveness is rewarding. Sweden has a long tradition of working in such partnerships, which has proven to be successful. The PPP's, as well as the Knowledge and innovation Community (KIC) concept within the framework of European Institute of Technology (EIT), are efficient and effective models which has demonstrated strong European added value. Through collaborative research on topics highly relevant for industry, companies of all sizes work in partnership with research actors to develop solutions with high added value. In these collaborations, public funding acts as a multiplier of the resources that companies invest into research and development and allow for a higher risk-taking, from the public and private sides.

Furthermore, an efficient collaboration between higher education, research and innovation is necessary to bring forward the skills we need for the future, encourage entrepreneurship and develop the next generation of successful innovations.

European Innovation Council (EIC)

Improvement of the support system to increase the potential of innovations, being incremental or disruptive, is important and for this purpose, a European Innovation Council (EIC) could possibly make a difference. Efficient and non-bureaucratic support for SMEs and start-ups is of course important but so is also collaboration between large and smaller companies. Innovation seldom happens, or flourishes, in isolation and working in strong ecosystems of different actors, large, small, private, public, often creates the right conditions for breakthrough solutions. EIC, which should not in itself be a pillar of the framework program, thus has to be developed in a way that is fit for purpose and adds complementarity to existing EU instruments and provides a clear European added value. While complementary and synergistic, research and innovation follow different logical patterns. It is very important that the introduction of an EIC does not dilute the funding of any other initiatives such as the ERC. The role of the EIC in relation to other instruments needs to be further defined.

³ https://www.vinnova.se/contentassets/d3fa44cef3c2408eb3d2a2b3e6da3f77/vi_17_06t.pdf

Other comments

Openness and confidentiality

One of leading words in the development of FP9 is “Openness”. Transparency and openness is of central importance in many research processes and initiatives such as open publishing, open data, open repositories and open innovation are generally positive. However, in some cases when there is a potential commercial interest, it has to be possible to keep results confidential for a period of time, for instance until patents are granted. The rules of FP9 initiatives need to take this, and other legitimate concerns regarding openness and confidentiality, into account, not least to ensure relevant participation by companies.

Evaluations

Independent evaluations and evidence should be integral parts of any system aiming at high quality research and innovation. Obviously, evaluations should be made in relation to purposes and intended effects of specific programs. Excellence is central but clear improvements in performance should also be taken into account. Causalities and outcomes need to be well described to learn for future activities. While the evaluation system should be improved care needs to be taken not to increase the work load of researchers, innovators and other participants in the framework program.

Preparation of this paper

Issues concerning the coming EU framework program for research and innovation (FP9) were discussed and analyzed by the IVA group for the coming framework program, and also at a workshop where a large array of interests from academia, the corporate sector and the public sector were represented. The IVA FP9-group consisted of the following fellows: Prof. Sophia Hober (Chair), Prof. Jan-Eric Sundgren, Prof. Kristina Mjörnell, Prof. Gunnar Svedberg, Prof. Lars Hultman and Prof. Stefan Bengtsson. Dr. Martin Wikström (research and education policy expert at IVA) was the secretary and project leader for the work. Final decision of the paper was taken by the CEO of the Academy, Prof. Tuula Teeri.