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Universities Denmark

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Position paper on the next European Framework Programme

The European Framework Programme for Research and Innovation plays a significant part in developing the research and innovation capacity of the European community as well as the individual member states. Public investments in research and innovation are necessary to boost excellent research and support radical, market-creating innovation.

The investments of today will have an important impact on economic growth, social development and job creation in Europe in the short as well as the long run. The future Framework Programme should strengthen the research quality in Europe, maintain Europe as a hub for groundbreaking research and innovation, and thereby strengthen European resilience and competitiveness.

Horizon 2020 has played a significant role in developing the research and innovation capacity of the European community as well as individual member states. Our hope is that the European community will maintain and strengthen the commitment to research and innovation for the benefit of Europe and the rest of the world.

Going forward, Universities Denmark urges the European politicians to strive for a framework programme that rightly emphasises excellent research as the main driver for societal development. We have 9 key messages and 42 recommendations to ensure the success of next framework programme.

Key messages

- Maintain excellence throughout FP9 to ensure innovation, growth and job creation
- Emphasise excellent research as the foundation for groundbreaking innovations
- Address the great societal challenges through frontier, interdisciplinary and collaborative research
- Ensure better involvement of Social Sciences and Humanities to maximise socio-economic impact
- Maximise long-term societal impact to benefit the European public
- Improve the standards of evaluation to ensure trust in the European Framework Programme
- Widen participation and optimise the use of structural funds in order to include excellence from all over Europe
- Establish a European Innovation Council with a strong base in science and an emphasis on simplification and consolidation
- Engage in joint activities and public-public partnerships that bring added value

Introduction

The European Framework Programme for Research and Innovation holds great importance. It is a cornerstone of European collaboration, and its most important task is to make use of the remarkable potential inherent in European research, technology and innovation. Like FP7, Horizon 2020 has been a great success. The programme has succeeded in mobilizing talented European researchers and entrepreneurs – and it has contributed greatly to the development of new knowledge, innovations and solutions to a number of societal and industrial challenges. While political support to research might be dwindling in individual countries, Europe must maintain its ambitions for FP9. Europe should remain a place believing and investing in science.

Europe is facing a number of challenges and opportunities; creating jobs and growth; addressing climate change and energy consumption; strengthening national and European security; and finding new solutions to conflict, poverty and migration. European research plays an important role in addressing these challenges and opportunities. More than ever, we are in need of a strong European research community to ensure that we have the right facts and the right evidence for independent scientific advice. We need to involve our best researchers and facilitate the valuable knowledge exchange with potential end-users and stakeholders. We need to support excellent research to ensure we have the proper foundation for European higher education activities, ensuring an increasing number of highly qualified university graduates.

Research and innovation is Europe's biggest asset. A recent study finds that roughly two thirds of European economic growth can be traced back to innovation.[1] It clearly shows that investing in research and innovation is a good investment, estimating the returns on European investments in research and innovation to be more than 20 %. Research is a prerequisite to European innovation, solutions and growth as well as to ensuring future welfare and sustainable development. Research based higher education is the main route to ensuring that scientific knowledge and innovation is widely disseminated in society, including in private and public employment. With this in mind, it is important to strengthen European innovation while safeguarding the quality of our research. This is why European added-value and world-class science must be at the core of the European research agenda – and why challenge-based and excellent research must remain the fundamental and driving principle in the European Framework Programme for Research and Innovation.

It is crucial to remember that European research is dependent on the determination, ambition and commitment of the European political communities if we want to maintain a position as innovative forerunner. Significant and long-term impact of research and innovation requires committed interdisciplinary research collaboration drawing on both technological and societal strengths and potentials, ambitious and stable funding, commitment of the main stakeholders, transparent framework conditions and long term planning as well as plenty of room for innovative and excellent new ideas to

[1] http://bookshop.europa.eu/en/the-economic-rationale-for-public-r-i-funding-and-its-impact-pbKI0117050/?CatalogCategoryID=Gj0KABst5F4AAAEjsZAY4e5L

develop and grow. We call on European politicians to reiterate their support for European research and increase the budget for FP9. As Carlos Moedas - Commissioner of Research, Science and Innovation - have stated, we should double our bet on Europe.[2]

1. Maintain excellence throughout FP9 to ensure innovation, growth and job creation

The pillar of Excellent Science is a cornerstone in European research, and it has contributed significantly to increased capacity and quality in European research. The European Research Council (ERC) has clearly demonstrated the value of excellence, and the bottom-up approach of the ERC and MSCA is of the greatest importance to the foundation of the European Research Area. An independent evaluation has concluded that the bottom-up research funded by the ERC has generated major impact, not only in purely scientific terms, but also by ensuring significant contributions to the economy and society at large.[3] In a similar fashion, the MSCA play an important role in supporting internationalisation, research mobility and talent development while promoting collaboration across countries, disciplines, universities and companies.

Increased funding for basic research is paramount to ensuring a stable and healthy foundation for European research, higher education and innovation, but is also a welcome investment for private companies, who rarely have the capacity and time to do exploratory research. Industry is highly dependent on the development of a new knowledge base as scientific breakthroughs are the ultimate precondition for innovation, growth and job creation. In a similar fashion, the most substantial contribution of science to private industry is the education of highly qualified universities graduate to innovate and improve industry performance. This highlights the need for a strong focus on excellence and mobilising the best researchers, students and entrepreneurs to contribute to innovative solutions and technologies.

However, going forward it is relevant to look into how the pillars complement each other. There is a need for greater synergy between activities across the pillars and back and forth within the knowledge chain in order to ensure the connection between fundamental research, collaborative research, applied science and innovation. Furthermore, while participation of private industry in the framework programme is important to the pillars of Societal Challenges and Industrial Leadership, the principle of funding big multinational companies by the same rate as smaller companies, non-profit organisations and universities seems inappropriate in view of the scarcity of public funding and the risk of distorting competition.

Universities Denmark recommends the following points:

1. The principle of excellence should be emphasised throughout the framework programme – not only in the Excellence pillar. Excellent science is the best foundation for groundbreaking solutions, higher education and world-leading innovations.

[2] http://sciencebusiness.net/news/80191/EU-Research-Commissioner-sees-opportunities-after-Trump-science-cuts

[3] https://erc.europa.eu/sites/default/files/qualitative_evaluation_of_completed_projects_funded_by_the_erc.pdf

2. More funding should be allocated to the pillars of Excellent Science and Societal Challenges by increasing co-funding from large companies throughout the programme. Especially Excellent Science – including the ERC, the MSCA and FET - should be given increased priority in FP9.
3. FET should be maintained as a key instrument in the Excellence pillar, and an additional and smaller FET-instrument should be added to FET Open and FET Proactive in order to increase the success rate and risk tolerance, giving a number of grants for short-term and small-scale projects.
4. More focus and follow-up funding should be given to projects already funded by the European Research Council, including the possibility of benefitting from the results of ERC-funded projects in the upcoming European Innovation Council and in higher education activities.
5. In order to ensure excellence remains the key principle in the European research and innovation framework programme, it is important to protect the criterion of excellence from the introduction of new sub-criteria, which would severely undermine the efforts to boost European research capacity.

2. Emphasise excellent research as the foundation for groundbreaking innovations

From many sides we have seen participants in the European Research and Innovation Framework Programme worry about the gap that has been created between the pillar of Excellent Science and the two other pillars. This is especially due to the emphasis placed on Technology Readiness Level (TRL) and later-stage innovation which has resulted in a disconnect between research and innovation activities.

Readiness levels – like Technology Readiness and Society Readiness - can be helpful in indicating which kind of projects are expected within a certain call. However, it is a great mistake to put too much emphasis on TRLs/SRLs alone. A wider range of Readiness Levels should be used in order to address the complexity of the topics in the calls. Often, a phase of lower TRL/SRL is necessary to achieve the higher level in the end. Innovation is not a simple, linear process, and often it relies on the synergies created between scientific disciplines and between fundamental science, applied research and development. Research and innovation with lasting and productive impact takes place in a circular, iterative and interdisciplinary process within a greater ecosystem, which continuously brings in new perspectives.

Universities Denmark recommends the following points:

1. Funding should be available to the most promising projects regardless of Readiness Levels (TRL/SRL). It is often in the early stage research that groundbreaking results can lead to radical innovation and the creation of new value chains.
2. More funding should be allocated to frontier research and collaborative projects at lower TRLs/SRLs outside of the excellence pillar to ensure synergies, strengthen the connection between research and innovation and to promote transnational research collaboration.

3. When it comes to strategic research funding it would be beneficial to explore the potential of connecting grants of exploratory reflections and research perspectives to applied research projects in order to ensure mutual inspiration and development of research perspectives during the project.
4. Funding should be provided to ensure support for groundbreaking research activities that take their point of departure from applied sciences.
5. It is necessary to increase support to early-stage proof-of-concept funding that enables Academia to test new ideas and applications in order to strengthen investment opportunities that can move groundbreaking innovations from the universities to private spinout companies. [4]

3. Address the great societal challenges through frontier, interdisciplinary and collaborative research

Europe is facing a number of societal challenges, and more are being added. Strategic and challenge-based research plays an important role in solving these issues, but we should be careful not to think that solutions only arise from projects close to the market. Frontier, interdisciplinary and collaborative research is key to solving the great societal challenges, just like excellent, timely and independent scientific advice is essential in ensuring evidence based solutions and effective policy-making.

Going forward, more flexibility and responsiveness is needed to address the societal challenges. Furthermore, more emphasis should be placed on large-scale investments achieving critical mass. The solution of complex problems can only be done by pooling and exchanging knowledge across borders, sectors, industries and society as well as including research perspectives from the entire spectrum of scientific fields and covering the entire value chain.

Universities Denmark recommends the following points:

1. It is necessary to broaden the scope of expected impact to generate groundbreaking solutions in the Societal Challenge Pillar, and in some cases, the issue at hand is so complex that it might be necessary to engage in bigger and more focused investments like the FET-Flagship programme when appropriate.
2. Addressing the societal challenges of Europe requires a better connection between the pillars of Excellent Science and Societal Challenges, and a better connection between the social inventions and the technologies that are supposed to bring solutions to society and the market and the groundbreaking research that is a prerequisite for the anticipated solutions.
3. The big societal challenges are not only a question of developing technological solutions. More attention should be given to non-technological and social issues such

[4] A study from the Danish Ministry of Higher Education and Science has shown that Danish university spinouts are more viable than other innovative companies: http://ufm.dk/publikationer/2016/viden-til-vaekst

as migration, geopolitical security and the societal and cultural frameworks for reaching the Sustainable Development Goals.

4. The new framework programme should ensure that there is sufficient funding for interdisciplinary research in the call structure, and that there are sufficient opportunities for Social Sciences and Humanities to take on more fundamental research questions of relevance to the topics at hand.

4. Ensure better involvement of Social Sciences and Humanities to maximise socio-economic impact

Social Sciences and Humanities (SSH) deal with crucial aspects of the solutions to the great challenges in our society. Horizon 2020 has made a great effort to strengthen SSH aspects of the challenge solutions. However, focus still seems to be primarily on the Science, Technology, Engineering and Mathematics (STEM) domains, and crucial SSH aspects are not sufficiently included in the call text. This jeopardises the overall impact of the funded projects.

Unfortunately, SSH is often viewed as supportive disciplines and included in the project design as an add-on consultancy service to STEM activities. This leaves insufficient room for the SSH aspects of essential importance to meeting the challenge and contributing to developing solutions. It is evident from the 2nd SSH monitoring report that the Flagging system for SSH inclusion is not sufficient to ensure substantial multidisciplinary and interdisciplinary research collaboration that brings together STEM and SSH in a way that is mutually inspiring and dependent.

Challenge-based research and cooperation with a view to integrating the relevant disciplines and stakeholders should play a much larger role in Framework Programme in order to ensure that both societal and technological dimensions of a given challenge are sufficiently addressed.

Universities Denmark recommends the following points:

1. The next Framework Programme should be organised in a way that promotes interdisciplinary research, ensuring the involvement of both STEM and SSH in developing the appropriate solutions. Work programmes and topic texts should be prepared with inclusion of experts from the whole range of disciplines, including substantial inclusion of Social Sciences and Humanities.
2. Within all Societal Challenges, more emphasis should be placed on interdisciplinary research, involving SSH researchers from the very beginning of the formulation of the societal challenge topics in collaboration with researchers from the STEM and Life sciences. This is paramount to maximizing the impact of European support to research.
3. The next Framework Programme should seek to integrate Social Sciences and Humanities when relevant in activities related to societal challenges and industrial leadership. By taking point of departures in the challenges identified or the industrial needs to be addressed instead of the development of specific technologies,

SSH can play a more substantial and meaningful role in multidisciplinary research collaborations.
4. Evaluation panels for proposals that include several scientific fields must include evaluators with an equally varied research background.

5. Maximise long-term societal impact to the benefit of the European public

Experience indicates that there is an immediate need for richer and better explained expected impact statements that go beyond TRLs, the delivery of products and commercial opportunities, and that a broader approach to the assessment of impact is needed, including a more long-term perspective and a more comprehensive approach to assess the potential for non-commercial and societal impact.

In connection to this, a broader and more interdisciplinary definition of impact could increase returns on the public investments made in the European Framework for Research and Innovation. Presently, there is a feeling that the current rather narrow interpretation of impact excludes many stakeholders and research fields from participation with a significant risk that high-potential proposals and valuable benefits to society are overlooked.

Universities Denmark recommends the following points:

1. The European Commission should take a broader and more flexible approach to the question of impact and engage with universities and other stakeholders to develop a meaningful, sensible and inclusive impact evaluation policy, including mechanisms to evaluate interdisciplinary projects.
2. Going forward, calls should clearly identify challenges, describe the desired impact and shy away from indicating preferred scientific disciplines or methods, giving researchers the freedom to combine research and innovation in a way they find relevant to achieve the expected impact and benefits to society.
3. The call topics should offer more guidance on when, how and to whom the impact is expected to materialize – including clearer definitions of short term and long term – in order to reduce the risk of different interpretations.
4. Coordination & Support Actions, Research & Innovation Actions and Innovation Actions are all valuable instruments, but in the next framework programme expected impact should better match the different project types.
5. No sub-criterion on SSH integration and geographical balance should be introduced to the criterion of impact as it imposes the risk of compromising the impact criterion. SSH aspects belong in the scope of the challenge definition as an integral part of the scientific excellence required to meet the challenge. European competitiveness is based on the ability to support the best research and innovation projects, and choice of partners and decisions about funding should be based on excellence and relevance to the desired impact.

6. Improve the standards of evaluation to ensure trust in the European Framework Programme

In order to ensure the success of; the trust in; and commitment to the European Research and Innovation Framework Programme, more effort should be made to ensure high standards and procedures for evaluation. Among other things, experience has shown that some evaluators find it difficult to judge projects of an interdisciplinary nature, and with no consensus meetings, the risk of generic, disparate or biased comments has increased. This can adversely affect the commitment to the European Framework Programme.

Going forward, it is very important that the evaluation feedback is adequate and relevant, allowing applicants above a certain threshold to learn from the experience and improve future proposals by getting more detailed feedback. Furthermore, it is important to improve the timing and quality of feedback to proposals approved for second stage submission.

Universities Denmark recommends the following points:

1. It is necessary to adjust the process for selecting experts for the evaluation panels. One option is to introduce permanent evaluation panels using ERC's panel rotation mechanism as an example.
2. Attention should be given to ensuring clear and systematic briefing of evaluators in a way that mirrors the call text. It is important that evaluators understand the specific call text correctly in order to avoid personal interpretation and ensure that evaluations are based on explicitly mentioned criteria in the call text.
3. Consensus meetings should be reinstated as they play an important part in ensuring sufficient exchange of opinions and arguments between evaluators; in reducing the negative influence of personal preference and understanding; and in preventing disparate evaluations.
4. Close match between the scientific elements of a topic and the scientific background of the selected evaluators would strengthen the evaluation process. This could include evaluators' experience with interdisciplinary projects in general, and the inclusion of Social Sciences and Humanities specifically, their openness to other disciplines and their understanding of challenges and possible parameters of success.
5. Evaluators should be allowed and encouraged to point at the potential of networking between similar project proposals of sufficient quality, including potential interdisciplinary synergies, making it possible to identify new consortia set-ups.

7. Widen participation and optimise the use of structural funds in order to include and develop excellence from all over Europe

Concerns have been raised about the low participation of some countries in the European Research and Innovation Framework Programme. It is of great importance that the European research programmes include a broad group of universities, industries

and other organisations in order to benefit from the pooling of excellence, knowledge and capacity. Excellence is to be found all over Europe, and it is a joint responsibility to make sure it is properly utilized.

It is unfortunate that some member states have been experiencing low participation rates. However, some countries are experiencing faster development due to targeted investments in selected sectors. Statistics show that public research investments in countries of low participation are scarce and in some cases declining. The European Commission should encourage national research systems to support the development of excellence and increased research capacity through national programmes for infrastructure and career development. Increased national research funding will not only strengthen national research capacity, but also improve national growth and job creation, improving the capacity to address economic and social issues.

The European community should address the issue of low participation of some countries in the European Framework Programme, but it should be done without compromising the criteria of excellence or adversely affecting the continued development of high quality research and solutions to the major societal challenges. European competitiveness is based on our ability to support the best research and innovation projects, and choice of partners and decisions about funding should be based on excellence and relevance to the project.

However, greater efforts should be made to align structural funds and the European framework programme in order to increase the research capacity in countries of low participation. Structural funds play an important role in strengthening capacity in member countries, and the European structural and investment funds (ESIF) should - to a much larger extent - be targeted at research and innovation throughout the innovation chain in order to improve national research capacity, job creation and economic growth.

Universities Denmark recommends the following points:

1. Structural funds should play a more prominent role in dedicated capacity building in research and innovation, including critical research infrastructures and research & innovation to ensure that low research-intensive countries can compete on excellence to the benefit of national and European research.
2. The European Commission should look into the possibility of connecting structural funds to FET Flagships, giving EU13 countries the chance join a FET Flagship in order to build capacity, network and experience. In a similar fashion, the European Commission - along with the European Research Council - should look into the possibility of connecting young researchers – especially from EU13 – to existing ERC-projects with use of structural funds in order to strengthen research capacity and quality in new member states.
3. Efforts should be made to broaden the knowledge of existing hubs of excellence in new member states. Unfortunately, there might be too little information about relevant research environments in new member countries, because of insufficient network activities allowing researchers to meet and collaborate.

4. To improve collaboration between member countries of high and low participation, the European Commission could take inspiration from international cooperation calls where selected partner countries are required to address a call on a specific topic. This could help countries of low participation to get access to well-established research communities within Europe on given topics – for example inspired by smart specialisation and investment strategies. At the same time, it would allow these countries to pool investments and efforts in selected areas of strength.

8. Establish a European Innovation Council with a strong base in science and an emphasis on simplification and consolidation

The idea of a new Council for Innovation - the European Innovation Council (EIC) - definitely holds interesting potential. We have seen great success in the European Research Council, but results are still lacking when it comes to fostering game-changing innovation and industries. The European research community holds so much potential, but we are lacking the proper structures to ensure full take-up of new research results into innovation activities.

However, to meet the objective of bringing more research results to the market and fostering more breakthrough innovation, it is important that EIC-activities build on excellent science with a focus on university-industry collaboration, research-driven innovation, bottom-up initiatives and interdisciplinary research. In this regard, the EIC could play an instrumental role in providing a horizontal Proof of Concept-scheme, taking inspiration from the successful ERC Proof of Concept funds. A crosscutting and generous Proof of Concept fund covering the entire FP9 could be highly beneficial in ensuring synergies between research and innovation.

The EIC has an important task in engaging private companies in European research activities, encouraging the European industry to increase their share of R&D spending and their commitment to the European research agenda. Furthermore, the EIC could play a role in promoting a culture where it becomes more attractive to start a new company. This includes support to innovation eco-systems as well as attracting and supporting entrepreneurial talents and ideas.

Thus, there are plenty of potential for a European Innovation Council in FP9, but it is very important to ensure a simple set-up with transparent decision-making processes and alignment with the rest of the framework programme. Horizon 2020 offers a variety of funding opportunities for innovation, but in a diversified and fragmented structure with instruments like the public-private partnerships, the European Technology Platform, the European Institute of Technology and the Joint Technology Initiatives. Careful consideration should be given to the effectiveness, complexity and transparency of these instruments and how they can be strengthened in a more consolidated effort to support research-based innovation. Bringing together current innovation schemes in a more consolidated structure is a prerequisite for strengthening European innovation, and the EIC should build on the experience of current initiatives to ensure

a well-structured, streamlined and simplified support system covering the entire innovation chain.

Universities Denmark recommends the following points:

1. EIC should focus on high quality and breakthrough innovation by using bottom-up instruments to fund research-driven innovation, technologies and solutions.
2. EIC should cover the entire innovation chain, ensure synergies with the entire programme and close existing gaps in the innovation chain. The gap between fundamental research and innovation activities as well as the need for an easy handover from the ERC PoC grants are examples to be addressed by the ERC and EIC in cooperation.
3. Efforts should be focused on building stronger European ecosystems, on bringing more research-driven results to the market and on scaling-up as well as on attracting and supporting entrepreneurial talents and ideas.
4. The European Commission should look into the possibility of developing and testing new instruments to foster exchange through university-business cooperation and leveraging more investments into high-risk research-driven innovation projects.
5. It is necessary to look into the effectiveness, impact and value-added of the current SME-instrument in Horizon 2020. Currently a great number of projects funded by the SME-instrument have been mono-projects, and in FP9 the European SMEs should be supported in joining a research-based consortium, giving them the opportunity to learn from other participants as well as benefitting from the involvement of university researchers, students and young entrepreneurs.

9. Engage in joint activities and public-public partnerships that bring added value

Public-public partnerships (PPPs) such as ERA-Net, article 185 and Joint Programming play an important role in pooling resources and constitute an important ecology of platforms for partnering across Europe, thus supporting the alignment of national research programmes and agendas. But in many countries it can be difficult to find sufficient public funding for university participation in these partnerships which is at odds with the idea that the European research programmes remain a stand-alone excellence programme that does not depend on individual countries' ability to co-fund programmes.

In addition to the question of ensuring national commitment to the partnerships, too much funding is tied up in the costs of administration and coordination. It is necessary to develop a new European strategy on the question of public-public partnerships with an emphasis on the access to national funding and reduced administration costs.

Universities Denmark recommends the following points:

1. The European Commission should initiate and include university representatives in the development of a new strategy for public-public partnerships and similar joint

activities with the aim to reduce the number of partnerships and focus on more long-term and grand-scale initiatives.

2. Investments in joint activities and public-public partnerships should be based on a more thorough analysis of costs and potential outcomes in order to focus available funds to the most promising activities.
3. The European Commission should strive to increase the attractiveness of the PPPs by increasing transparency and reducing the administrative costs of participation. To a large extent, similar rules and conditions should apply to all types of partnerships.
4. The public-public partnerships should be more closely aligned to Societal Challenges in the framework programme while COST should support the creation of European networks with the objective of preparing consortia to specific calls.
5. The low participation of EU13 in European platforms and networks - such as the public-public partnerships - indicate that it might be difficult for new stakeholders to find time and resources to participate in these platforms which negatively affects their possibility of finding European partners. More national and European funding is needed in this area.

About Universities Denmark

Universities Denmark is the organization of the eight Danish universities to enhance their cooperation, visibility and impact.

Universities Denmark works to ensure that its members have the best possible conditions for shouldering their responsibility towards research, research-based education and dissemination of knowledge. University management and staff convene at Universities Denmark to discuss issues of common interest, to take joint initiatives, and to communicate with politicians, ministries and partners.

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