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Flemish position paper on the European ninth Framework Programme for RTD

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Colophon

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DEPARTMENT OF
ECONOMY, SCIENCE & INNOVATION



Introduction and Executive Summary

When a new European framework programme for research and technological development (FP) is in the making, it is the moral duty of the national/regional administrations to express their opinion on which basis such a programme should be organised. The next, ninth FP (FP9) concerns many national/regional stakeholders, has an important impact on the science and innovation performance of a country/region by the funding volume and underlying principles that express common values shared by the member states of the European Union, the European Commission and the associated countries. Hence, the Flemish Department of Economy, Science and Innovation took the lead in organising its stakeholders to prepare a common position paper on FP9. In this paper, we make clear which general principles are important for us, but we do not want to “hide behind the headlines”¹ and hence, propose some ideas on how to implement these principles or to tackle urgent issues.

Investments in Research and Development and Innovation (R&D&I) in FP9 should represent a significantly increased part of the future overall EU budget compared with the share of Horizon 2020. In turn, each EU country has to take up its responsibility as well as expressed by the 3% target. Flanders joins the many voices (including the European Parliament) that ask for a budget of €100 billion.

To achieve real impact on the life of EU citizens, societal challenges should form the core of FP9 in such a way that the entire innovation chain (or all technology readiness levels) is covered to stimulate the transformation of basic research ideas into solutions to societal targets. This requires in addition tighter linkages between the various components of FP9, namely an infrastructure component, a societal challenge component, an excellence research and high risk innovation component, and finally a component to support leading innovative enabling themes, topics and technologies. Also “specifically dedicated” instruments, such as the EIT-KICs, Jus, cPPPs, cannot work in isolation with risks on overlaps and missed opportunities.

ERA priorities are to be supported by FP9, with the inclusion of Responsible Research and Innovation. The Social Sciences and Humanities should be fully integrated in FP9, in particular in the societal challenges component. A higher involvement of stakeholders (inter alia through citizens science) would be beneficial.

FP9 should continue to award funding only to the best proposals (excellence) in a process of international competition. It should provide ample and balanced room for small- and large-scale, bottom-up, top-down collaborative research programmes. Mono-beneficiary instruments have to clearly provide their EU added value rationale. Simplification of procedures, administration, etc. are continuous concerns, which co-determine the attractiveness of the FP9, are advantageous to all applicants, and in particular to newcomers from any EU member state or associated country. Also, the reduction of the number of instruments, and their variability, lowers thresholds to participation. Availability of sufficient funding is a key driver to increase the success rate and attractiveness for all types of applicants. Cooperation and interaction between various types of applicants from different areas and fields must be stimulated in cross and multidisciplinary projects.

Linkages and complementarities with other EU programmes, in particular COSME and ESIF must be strengthened as well. In particular, allocating ERDF in combination with FP funding could be instrumental in leading less R&I performing countries towards FP9. This could be extended towards the Joint Programming Process in general with its many co-funding instruments, and Joint Programming Initiatives in particular as they also aim at tackling societal challenges.

¹ As eloquently stated by dr. Ehler (MEP) during the presentation of the Polish position paper on 26/04/2017.

Five page summary

General Introduction

This paper reflects the common position of the Flemish Department of Economy, Science and its stakeholders. In this paper, we make clear which principles should underlie the next Framework Programme (hereafter: FP9). At the same time, we do not want to “hide behind the headlines”, so we propose some ideas on how to implement these principles and on how to tackle urgent issues.

Investments in Research and Development and Innovation (R&D&I) in FP9 should represent a significantly increased part of the future overall EU budget compared with the share of Horizon 2020. In turn, each EU country has to take up its responsibility as well as expressed by the 3% target. Flanders joins the many voices (including the European Parliament) that ask for a budget of €100 billion.

The following main principles should be applied when drafting the new FP:

- Excellence should remain the main evaluation criterion
- The entire innovation chain should be addressed
- Large scale infrastructures should also be useful for innovation activities
- An appropriate proportion should be maintained between top-level programme strategies, “bottom-up” generation of fresh ideas and “solutions” to societal challenges
- Simplification and rationalisation should lead to a more inclusive funding landscape
- Next to open innovation in the more technology oriented spheres, societal innovation and responsible research and innovation should receive the appropriate attention
- FP9 must remain sufficiently attractive for applicants (both content-wise and in terms of the success rate) and newcomers (by lowering/removing barriers)

Major Issues

We have some concerns about aspects of the Horizon 2020 programme, which need to be addressed appropriately by FP9. These concerns can be summarised as:

- 1) Interaction and cooperation between different disciplines and different types of actors is to be stimulated and promoted. A better connection between the various components, programme lines, work plans and funding instruments may be instrumental to achieve this.
- 2) Project proposals addressing societal challenges should cover the entire technology readiness level (TRL) range in a dynamic way (i.e. fundamental ideas should be able to “climb up” the TRL ladder and be transformed into innovative solutions to a challenge). Successive calls taking into account the outcomes of earlier projects from different FP blocks may be envisaged.
- 3) A sound balance between the involvement of the different players should be ensured. Incentives must be created and barriers abolished to ensure collaboration between universities, universities of applied sciences, research centres, policy and public engagement bodies, small and large industrial players and civil society in a composition that best suits the proposed research and its intended results and exploitation. FP9 should provide ample room for small-scale, and large-scale, bottom-up and top-down collaborative research programmes.
- 4) There is a need for coherence between European, national and regional science policies. We should strive for a complementary division of labour between FP9, national/regional research and innovation policies and Joint Programming Initiatives’ strategic research and innovation agendas.
- 5) Social Sciences and Humanities (SSH) must be an integral part of the activities of FP9. This implies that SSH experts are to be involved at all stages of the programme, in particular during consultation and evaluation of research proposals, by including experts from the SSH area on the evaluation panels and in advisory groups.
- 6) The input of citizens and civil society should be incorporated in the debate on science and society, to improve the innovative capacities and entrepreneurship. “Responsible Research and Innovation” best practices should be mainstreamed throughout FP9 as a whole. Social sciences and humanities

can provide a framework to inform the public of the benefits the FP brings for society and counter the increasing distrust in science and innovation.

- 7) The different available funding sources have different objectives. While the Framework Programme strives for excellence and competition, the European Regional Development Fund (ERDF) is focussed on the cohesion objective, and COSME emphasises the competitiveness of SMEs. Although currently synergies may be difficult to achieve in practice, an analysis at programmatic, procedural and strategic levels may offer new opportunities.
- 8) When potential applicants become reluctant to submit proposals due to a combination of (perceived) overhead and low success rates (in some cases almost equal to chance), the FP loses its attractiveness and risks missing its goals. Various complementary countermeasures at different levels and places in FP9 are needed.
- 9) Excellent projects and excellent applicants should receive European funding. It cannot happen that proposals with a maximum score are not funded.

Overall structure of FP9

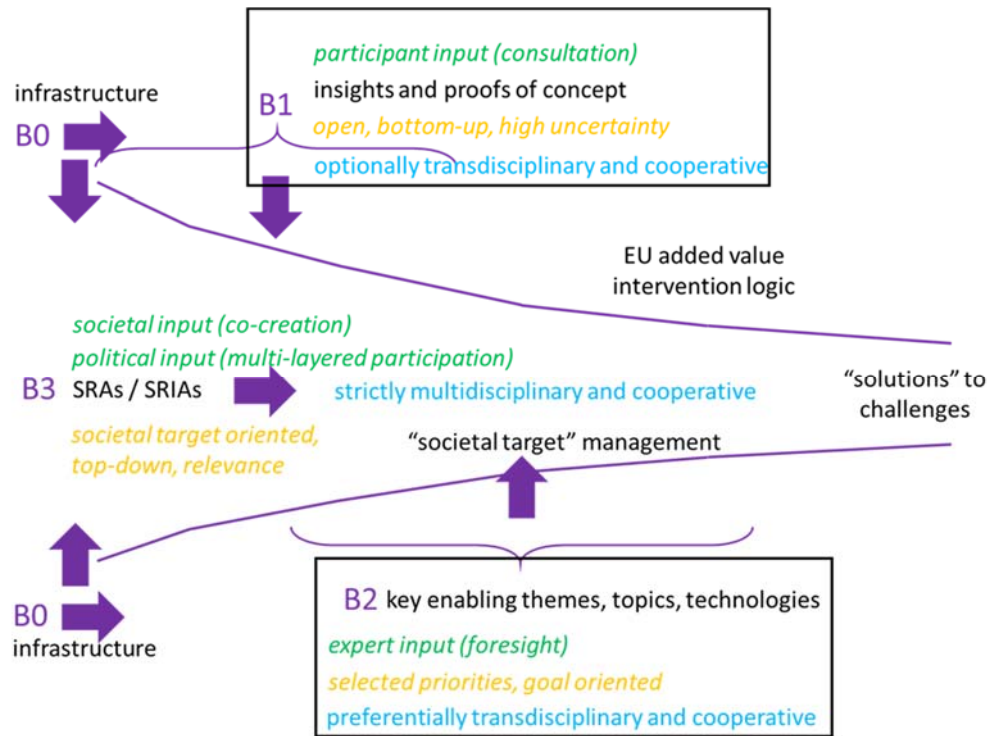
FP9 should provide ample and balanced room for small-scale and large-scale, bottom-up and top-down collaborative research programmes. Mono-beneficiary instruments have to clearly provide EU added value in virtue of the subsidiarity principle. Also, the reduction of the number of instruments and their variability could lower thresholds to participation. Availability of sufficient funding is a key driver to increase the success rate and attractiveness for all types of applicants. Cooperation and interaction between various types of applicants from different areas and fields must be stimulated in cross- and multidisciplinary projects.

To achieve real impact on the life of EU citizens, societal challenges should form the core of FP9 in such a way that the entire innovation chain is (or all technology readiness levels are) covered to stimulate the transformation of basic research ideas into contributions to societal targets. This requires tighter linkages between the various, otherwise “autonomous” components of FP9. These components are an infrastructure component, a societal challenge component, an excellence research and high risk innovation component, and finally a component to support leading innovative enabling themes, topics and technologies. Also “specifically dedicated” instruments, such as the European Institute of Technology - Knowledge Innovation Centers (EIT-KICs), Joint Technology Initiatives (JTIs), Joint Undertaking (JUs), contractual Private Public Partnerships (cPPPs), cannot work in isolation with risks of overlaps and missed opportunities.

Linkages and complementarities with other EU programmes, in particular COSME and European Structural and Investment Funds (ESIF), must be strengthened as well. In particular, allocating ERDF in combination with FP funding could be instrumental in leading less R&I performing countries towards FP9. This could be extended towards the Joint Programming Process in general with its many co-funding instruments, and Joint Programming Initiatives in particular as they also aim at tackling societal challenges. The European Defence Action Plan, on the other hand, should be a separate programme (with its own budget but not at the expense of FP9).

ERA priorities are to be supported by FP9, with the inclusion of Responsible Research and Innovation. The Social Sciences and Humanities should be fully integrated in FP9, in particular in the societal challenges component. A higher involvement of stakeholders (inter alia through citizens science) would be beneficial.

Therefore we promote the following structure for FP9 that uses the metaphor of the innovation funnel: ideas and technologies can be spun in and out the R&D&I pipeline, in addition to the ideas that evolve towards a solution in the funnel itself. Applied to FP9, this means that block² 3 (societal challenges) is the central axis and innovation pipeline while ideas can be spun in from both blocks 1 and 2, albeit at other stages (depending on the TRL). Notwithstanding, blocks 1 and 2 have their own, separate intervention logic and do not operate in function of block 3. Block 0 (infrastructure) ‘serves’ all three other blocks. Within block 3, projects should be able to climb up the ‘TRL ladder’, i.e. gradually moving from initial idea to a ‘close to a solution’ stage. We believe that such a structure is able to overcome many of the challenges listed above.



Other headlines

In the following sections we present the remaining headlines. Details can be found in the position paper.

- **Excellent and disruptive R&I [Block 1]**
 - European Research Council (ERC) and European Innovation Council (EIC) should go into one block.
 - EIC should be bottom-up and focus on excellent innovation projects.
 - Strengthen the ERC.
 - Scientific excellence should be the only evaluation criterion applied by the ERC.
 - The bottom-up principle of Future and Emerging Technologies (FET) is its strong point.
 - Ensure good links between ERC, FET and EIC.
 - We support the current way of determining the topics of FET Flagships.
 - FET Proactive is a good practice for determining research themes.
 - Research funding needs to tackle future societal challenges.
 - Peer reviews based on excellence are central.
 - Ensure a good proportion between the different types of grants.
 - We support Marie Skłodowska Curie Actions MSCA.

² In order to avoid confusion with the Horizon 2020 pillars, we use the term ‘block’ to refer to the “new pillars” of our proposal for FP9.

- **Leadership in innovation [Block 2]**
 - Fund knowledge and technologies 'to make the future'.
 - The SME instrument should go under EIC.
 - The financial instruments should cover all blocks.
 - Simplification for enterprises is a must.
 - *Leadership in Enabling Innovative Themes, Topics and Technologies*
 - The five current Key Enabling Technologies (KETs) need to be reviewed and, if necessary, updated.
 - *Access to risk finance*
 - Improve the EU venture capital market.
 - More awareness raising is needed.
 - Consider novel forms of financing, such as crowd funding.
 - Financing for demonstration and pilot projects is essential, but the choice should remain with the participants.
 - *Innovation in SMEs*
 - Support for scale-ups is necessary to overcome the European innovation paradox.
 - Keep the integrated link between innovation and business services through the Enterprise Europe Network.
 - Support for market uptake activities is needed.
 - Optimise the SME instrument to show real EU added value respecting the subsidiarity principle.
 - Mainstream the SME Innovation Associate pilot.
 - *Coherence with 'related' instruments*
 - Public Private Partnerships (PPPs) should work in a more transparent way.
 - JTIs/JUs need to be evaluated according to a pre-defined metrical evaluation framework.
 - A bigger voice for public partners is needed. The Commission needs to take up its role better.
 - Better involvement of SMEs, academia and clusters is needed.
 - Back to basics: JUs should leverage new private investments in the EU.
 - All JUs need to finalise with close-out meetings.
 - The recommendations of the European Court of Auditors should continue to be implemented.
 - Focus on consolidating the existing KICs.
- **Societal challenges [Block 3]**
 - Use a broad definition of innovation.
 - A new scheme for collaborative R&I for longer-term impact, spanning all TRL levels (from idea to solution) over recurrent calls to effectively address societal targets.
 - Cascading calls might be needed to bring ideas to the market.
 - *Links with Joint Programming*
 - Better link up of JPIs and FP.
 - Ensure sustainability of JPI results.
 - JPIs should not cannibalise the FP funding.
 - JPIs can be used as a step-up towards FP participation.
 - Streamline rules for the different joint programming.
 - Establish a Joint Programming Agency to simplify rules.
 - Establish a Joint Programming House to lower administrative burdens and improve interactions.
 - Make more use of innovative procurement tools in the framework of JPIs.

- **Governance and horizontal issues**
 - Offer a voice to citizens on the desirability of socio-technological evolutions and societal challenges.
 - *Role of programme committees*
 - Add more transparency to the current system.
 - Assure quality and respect for procedures and supervise the Commission's work.
 - *Social Sciences and Humanities (SSH)*
 - SSH should be an integral part of a broad range of projects.
 - SSH-projects should also be funded in their own right and not always as part of bigger projects.
 - The variety of the SSH domain needs to be acknowledged.
 - *Regional connectivity: 9FP and ERDF*
 - We need more synergies between FP and ESIF, but without adding to complexity.
 - Synergies should go beyond Horizon 2020 and ERDF.
 - The regional dimension needs to be better integrated in the FP through an effective multi-level governance model that combines policy levers at different levels.
 - Mixed funding approaches are needed.
 - Inter-clustering activities need more support.
 - *Mobilising Excellence*
 - Excellence is a driver of structural reform.
 - Use ERDF for 'catch-up' or 'back-up' financing.
 - Dedicate ERDF funds to Seal of Excellence projects.
 - An ERA-Net Cofund for Mobilising Excellence could form a new approach, combining FP and ERDF funds.
 - Strengthen the National Contact Points.
 - Improve local infrastructure of promising research performing organisations.
 - Involve the EIT-KICs.
 - *Responsible Research and Innovation (RRI)*
 - Make RRI a horizontal issue.
 - Explore alternative business models.
 - Exchange best practices on involving non-scientists.
 - Emphasise gender more, both in research funding as in programme governance.
 - *Internationalisation*
 - Mainstreaming internationalisation has failed so far. A return to a specific internationalisation instrument should be considered.
 - The UK should become our preferential third country partner after Brexit.
 - *Success rate / oversubscription*
 - The low success rate needs to be tackled through various measures to retain the attractiveness of the FP.

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1 Preliminary remarks

Investing in R&D&I is essential to safeguard the EU's long term competitiveness.

The European Union cannot afford to reduce its efforts regarding Research and Development and Innovation (R&D&I), as the EU has to remain competitive compared with other parts of the world that keep on increasing their investments in R&D&I. The recent European Semester Reports show that underinvestment in research and innovation (R&I) is hurting Europe's long-term productivity, through a slowdown in its the rate of innovation and technology diffusion. The impact of research and innovation policies is greatest if the EU acts together, thereby achieving a critical mass in order to be internationally competitive and tackle grand challenges (such as the sustainable development goals). Difficult choices need to be made on the distribution of the available EU budget to safeguard sufficient critical mass for the 9th European Framework Programme (FP9).

Creating a conducive environment for R&D&I is also a Member State's responsibility.

However, some issues cannot be solved by the FP9 for R&D&I (alone) but are the main responsibility of the individual member (or associated) states. In particular, issues such as the attractiveness of researcher careers, the use of structural funds, the participation in Joint Programming activities, the national/regional budget for R&D&I, the investments in large research infrastructure, the functioning of local R&D&I systems, ... are to be tackled by all competent authorities, in particular if the EU wants to bridge the innovation divide.

Consequently, a plea to reserve a relatively larger part of the overall EU budget for FP9 must also imply a higher national/regional budget to be allocated to R&D&I (inter alia, to reach the 3% research intensity target) – irrespective of whether funding is distributed through national/regional instruments, FP9 or co-funded instruments. A more substantial national/regional budget available for R&D&I is likely to reduce the pressure on the FP success rates as more applicants will be served by their local instruments instead of having to turn to the FP. EU regulations to avoid macro-economic imbalances and the related austerity policies do not allow deficit spending for higher national budgetary commitments for R&D&I (for the Euro zone countries). This is all the more so given that the yearly Framework Programme Monitoring Reports of the European Commission (COM) show that countries that invest in more R&D&I on national/regional level are at the forefront in European programmes.

2 Strategic issues

2.1 Main principles to be applied

The FP9 should be characterised by a number of important features including:

1) **Excellence and international competition** should remain the main evaluation criteria. However, excellence cannot be narrowed down to scientific excellence only. All projects, irrespective of their type should be “simply the best”, or “better than all the rest” in accordance with the goals and targets defined beforehand, e.g. in the context of instruments that support “widening”, successful proposals should be those that facilitate widening in the best way to achieve the goals. However, no geographical, political correction factors can be applied. Structural funds (co-funding schemes) are to be used for catching-up and supporting convergence activities. For other instruments, excellent entrepreneurial skills might be required. Extending each FP9 instrument with a widening variant or (“mainstreaming widening”) is not the way forward either (cf. section 8.2 for more suggestions regarding widening, in particular the suggestion for a new designation of ‘mobilising excellence’ instead of widening).

2) The new FP has to cover **the entire innovation chain** in order to tackle common parts of broad societal challenges or more specific *societal targets* (others may call this “missions”) through an integrated portfolio of support measures and financing mechanisms. In addition, all scientific, technological as well as non-technological domains required to tackle a challenge or meet a societal target must be combined in a multidisciplinary manner. Room for bottom-up, researcher-driven and knowledge-driven R&D&I activities must be guaranteed in separate parts of FP9, while ensuring linkages between the various parts with an appropriate proportion of R&D&I on the lower and higher TRLs. Also, bridging towards (and from) other EU programmes should be made easier. The societal targets should have clear goals and well-circumscribed expected societal results that make it easier for the EU citizens to experience the impact of FP9.

3) Large scale infrastructures should not only be oriented towards research purposes, but also to **innovation activities** that require large-scale investments and offer a clear EU added value. Synergies are to be sought with support from ESIF, EFSI, ESFRI and otherwise national/regional initiatives.

4) An appropriate proportion between **top-level programme strategies, “bottom-up”** generation of fresh ideas and **“solutions”** to societal challenges should remain a core feature.

5) **“Simplification”** and “rationalisation” of procedures, rules, administrative burden and number of instruments (and their instances) should remain a top priority. Harmonising rules offers a significant advance (in particular regarding ERA-Nets CoFund).

6) The strong features of Horizon 2020, e.g. the **European Research Council** (ERC), the Marie Skłodowska-Curie Actions, NMBP/Spire, should be continued. However, in particular for mono-beneficiary instruments (cf. also the EIC) the European added value of the instrument must always be the touchstone and well justified beforehand. In particular regarding the SME instrument, the subsidiarity principle should be respected.

7) Priorities of the ERA Roadmap are to be integrated in the overall governance of the FP9 (e.g. open access, gender, ...). Next to **‘open innovation’**, also **‘social innovation’** and **‘responsible research and innovation’** should receive sufficient attention and focus. A renewed vision on the inclusion of the Social Sciences and Humanities (SSH) is instrumental for the latter.

8) The **budget for FP9** should represent a significantly increased part of the future overall EU budget compared with the share of the current overall EU budget that has been reserved for Horizon 2020, continuing the annual increase of the FP’s budget of the past 10 years.³ At least 25% of the EU’s total budget for the next period should be devoted to strengthening Europe’s future knowledge base, through enhanced investments in education, research, and innovation (e.g. via Erasmus, the next FP, and targeted parts of the

³ In absolute numbers, €100 billion would be a symbolic amount.

structural funds). Currently, this amounts to less than 20%. Flanders joins the many voices (including the European Parliament) that call for a budget of €100 billion.

9) The **attractivity of FP9** should not be hampered by a too high oversubscription, a too low acceptance rate, a too important time investment, a too complex and confusing funding landscape, and too different funding instruments.

2.2 Main challenges to address

Flemish stakeholders and public authorities have some concerns about aspects of the Horizon 2020 programme, which need to be addressed appropriately by the future FP9. These concerns can be summarised as:

1) Interaction and cooperation between different disciplines and different types of actors should be stimulated and promoted. A better connection between the various components, programme lines, work plans and their funding instruments may be instrumental to achieve this.

2) To address the Societal Challenges, project proposals addressing societal challenges should cover the entire TRL range in a dynamic way. Successive calls taking into account the outcomes of projects from different FP blocks may be envisioned.

3) A sound balance between the involvement of the different players should be ensured, incentives created and barriers abolished to ensure the formation of ecosystems of collaboration between universities, universities of applied sciences, research centres, policy and public engagement bodies, small and large industrial players and civil society in a composition that best suits the proposed research and its intended results and exploitation. FP9 should provide ample room for small- and large-scale, bottom-up, collaborative research programmes.

4) There is a need for coherence between European, national and regional science policies and for a complementary division of labour between FP9, national/regional research and innovation policies and strategic research and innovation agendas by the JPIs.

5) Social Sciences and Humanities must be an integral part of the activities of FP9. This implies that SSH experts are to be involved at all stages of the programme, in particular during consultation and evaluation of research proposals, by including experts from the SSH area on the evaluation panels and in advisory groups.

6) Flanders emphasises the importance of incorporating the input of citizens and civil society into the debate on science and society. It is indeed paramount in a transparent democratic process: public engagement and public participation in R&D&I will improve the innovative capacities and entrepreneurship. “Responsible Research and Innovation” best practices should be mainstreamed throughout FP9 as a whole. Given the limited visibility of the FP outcomes for society, and distrust in science and innovation by an increasing part of the population and the great, albeit doubtful impact of alternative facts, social science and humanities can provide a framework to inform the public on the benefits the FP brings for society.

7) The different funding sources available have different finalities. While the Framework Programme strives for excellence and competition, the ERDF is focussed on the cohesion objective, and COSME emphasises the competitiveness of SMEs. Although, currently synergies may be difficult to achieve in practice, an analysis at programmatic, procedural and strategic levels may open new opportunities. Alignment and better integration of the European Structural and Investment Funds (ESIF), in particular the European Regional Development Fund (ERDF)⁴ which can support research and innovation activities of COSME and other complementary funding sources under the new framework programme, may contribute to a more efficient and cost-reducing innovation system.

⁴ It is possible that in some countries also the European Agricultural Fund for Rural Development (EAFRD) can be better aligned with FP9.

8) When potential applicants become reluctant to submit proposals due to a combination of (perceived) overhead and low success rates (in some cases almost equal to chance), the FP loses its attractiveness and risks missing its goals. Various complementary countermeasures at different levels and places in FP9 are needed.

9) It is important to ensure an appropriate proportion between bottom-up and top-down approaches for FP9 as a whole.

10) Excellent projects and excellent applicants should receive European funding. It must not happen that proposals with a maximum score are not funded.

2.3 Overall strategic vision and ensuing structure of FP9

Europe is confronted with external and internal challenges.

Europe finds itself at a crossroads. Climate change, food security, ageing society, energy provision, health care, water crisis, refugee crisis, threat of terrorism and religious radicalisation, polarisation, etc. are just a few of the many urgent global societal challenges European society is facing today. In addition, the European Union is confronted with internal challenges such as a growing degree of distrust in its functioning and added value, fed by a rising wave of nationalism, particularism and a hostile attitude towards in-coming migration. Brexit is the most serious and recent manifestation of these phenomena combined, with a campaign relying on what is now referred to as alternative facts and disbelief in (academic) expertise and objectiveness. Unfortunately, this global trend is spreading also in Europe. Furthermore, the protection and sustainable management of natural resources and ecosystems and a sustainable supply and use of raw materials are also crucial to safeguard a resource- and water-efficient and climate change resilient economy and society.

The EU needs to invest together to face these challenges.

To address these numerous challenges, policy makers, the research community, industry and civil society should join forces and collaborate on research and innovation to create critical mass and invest in sustainable growth and job creation. In a context in which budgetary rigidity still holds, this implies that scarce (financial) resources should be invested in synergetic endeavours with clear goals and attainable impacts for greater wellbeing of European citizens.

The 9th FP will be a key instrument for our collaboration and represents a true EU added value.

The 9th FP for R&D&I should therefore be a very strong instrument to address the most important or pressing societal challenges by means of scientific research covering any area or domain. It should develop key enabling technologies, themes and topics, and contribute to innovation in the broadest sense (including social/societal innovation and responsible research and innovation). The FP is one of the prime instruments to demonstrate the added value of the European Union and bring the various Member States and associated countries together, despite the rather gloomy context sketched above.

The three current pillars of Horizon 2020 should be better integrated, with the current third pillar being the backbone that provides responses to the challenges we face.

This means that pillar 3 Societal Challenges of the earlier Horizon 2020 programme should become the backbone of the new FP9, as shown in Figure 2. An important problem with the structure of the current Horizon 2020 programme is that its three pillars (see) should be integrated in a substantially stronger way.

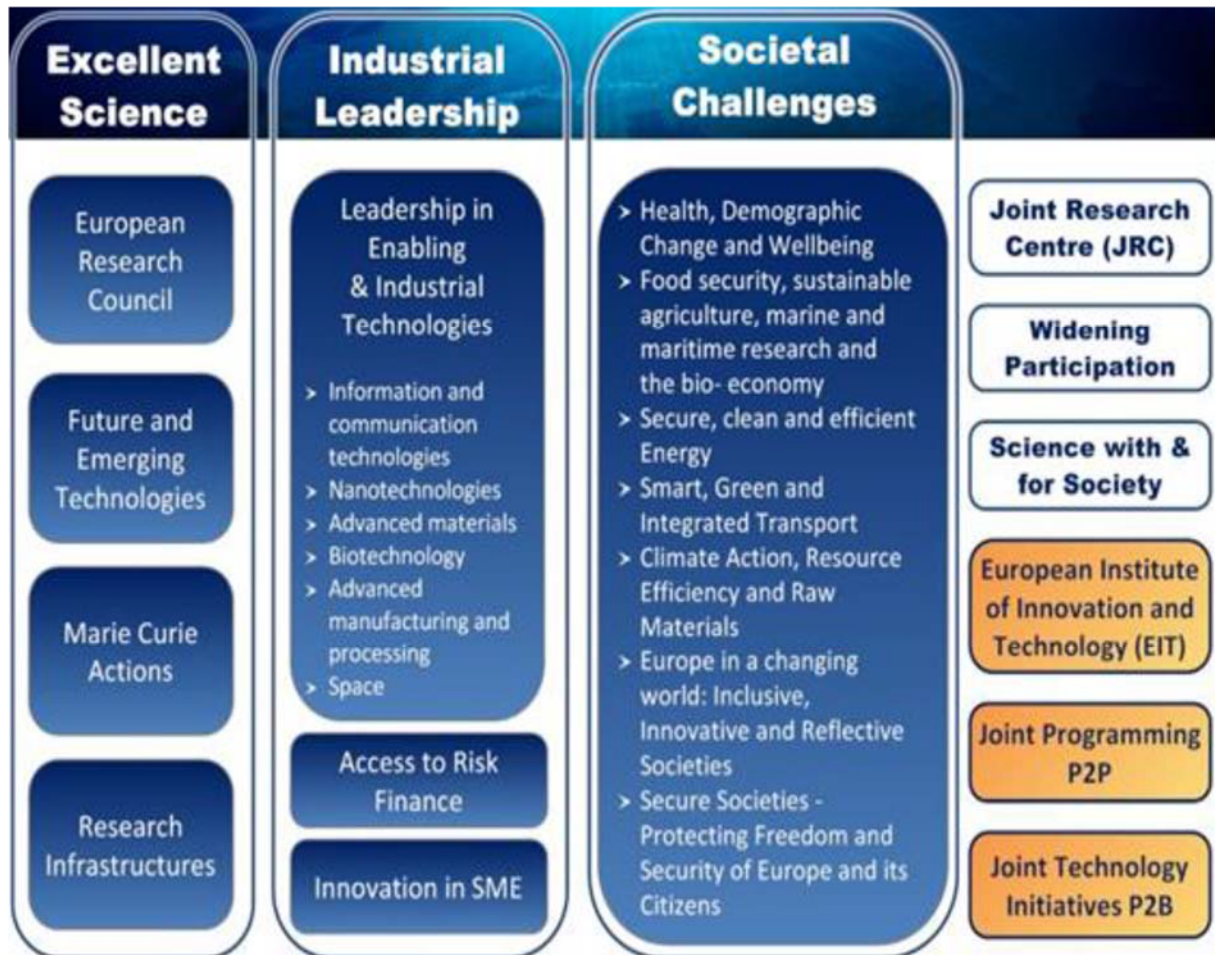


Figure 1: Structure of Horizon 2020 ⁵

Figure 2 uses the metaphor of the innovation funnel: ideas and technologies can be spun in and out the R&D&I pipeline, **in addition to the ideas that evolve towards a solution in the funnel itself**. Applied to FP9, this means that block⁶ 3 (societal challenges) is the central axis and innovation pipeline while ideas can be spun in from both blocks 1 and 2, albeit at other stages (depending on the TRL). Notwithstanding, blocks 1 and 2 have their own, separate intervention logic and do not operate in function of block 3. Block 0 (infrastructure) ‘serves’ all three other blocks. This frame of reference should replace the current “disconnected approach”, creating a shift from funding individual R&I ideas into investing for future success.

⁵ Reproduced from COMMISSION STAFF WORKING DOCUMENT, IN-DEPTH INTERIM EVALUATION of HORIZON 2020, SWD(2017) 220 final, p.10

⁶ In order to avoid confusion with the Horizon 2020 pillars, we use the term ‘block’ to refer to the “new pillars” of our proposal for FP9.

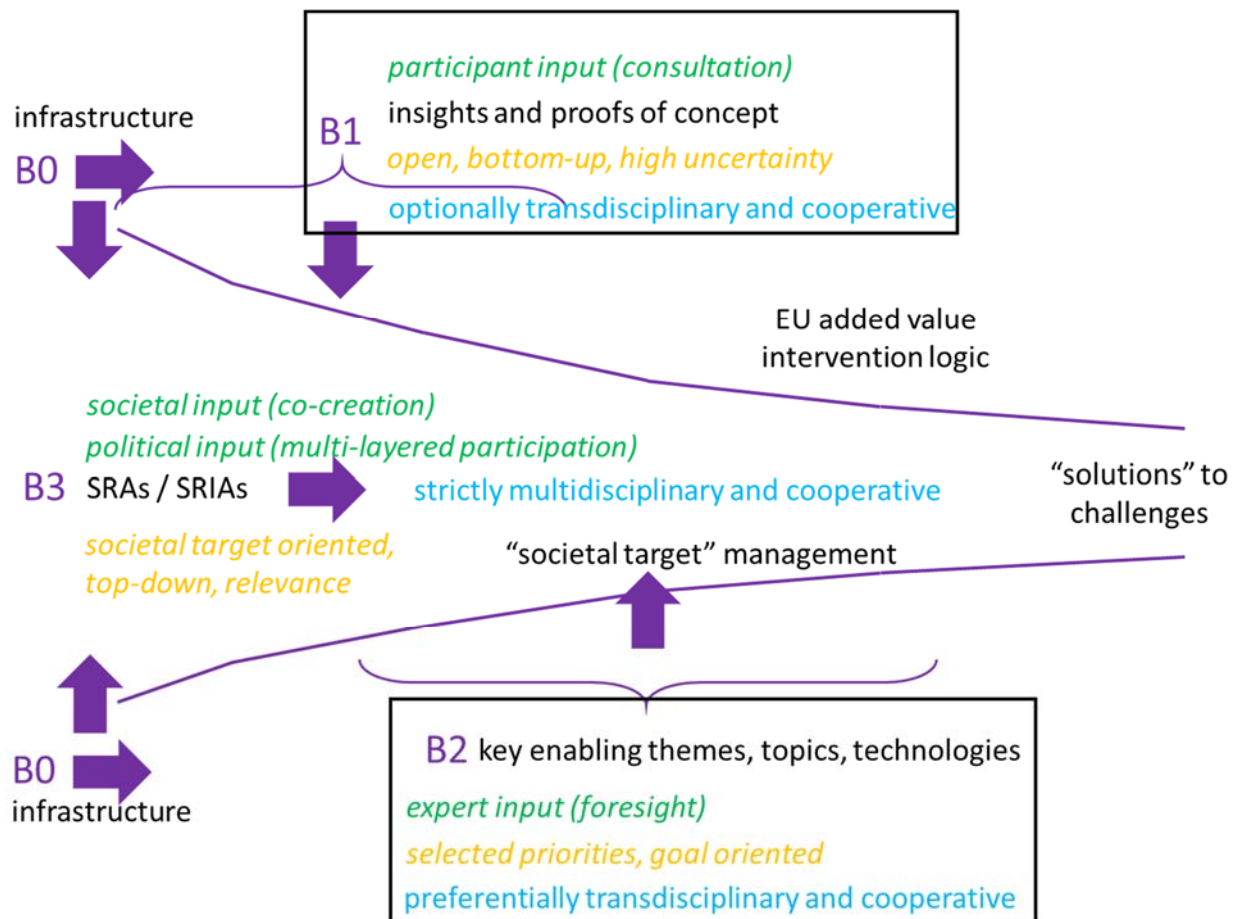


Figure 2: proposed conceptual architecture for FP9

Within block 3, projects should be able to climb up the 'TRL ladder', i.e. gradually moving from initial idea to a 'close to a solution' stage.

Close-out meetings can provide a tool to push valuable project results along the innovation chain, thus improving the integration of the programme.

All FP projects must conclude with close-out meetings that summarise the results and outcomes of the project. Close-out meetings can prove a very valuable tool to be used more broadly in a portfolio management of project results.⁷ Availability of close-out reports can justify follow-up calls or other initiatives to ensure continuation or sustainability of project outcomes and results.

This approach would ensure that valuable project results and outcomes are not lost and can be taken further along the innovation chain, while leaving sufficient freedom for new players to take up (parts of) projects, thus ensuring that not only preformed consortia benefit from FP participations. The intention of finalising projects through close-out meetings should be foreseen upfront in the project workplan. Close-out meetings should also involve relevant stakeholders from academia and industry next to the obvious project partners.

There is need for broad involvement of stakeholders and civil society. The role of the Programme Committee will differ according to the pillar.

⁷ Close-out meetings are applied by the JTI IMI2. During a close-out meeting, an inventory is made of the achievements of a project with a specific eye on which results have a potential for further valorisation and/or development.

Societal challenges concern all levels and actors of society. Therefore, all relevant types of actors should be involved from the start in the definition of strategic plans, work plans etc. bottom-up via (open) consultations and open discussions on content.⁸ Social Sciences and Humanities (SSH) almost naturally are to be integrated in multidisciplinary cooperative project teams (cf. section 7.3). Social/societal innovation should be part of block 3 almost by definition. Such an approach impacts on the role of the programme committees. Although they still occupy a central place in the FP governance structure, their precise task, role and responsibilities differs according to the FP9 block – cf. section 7.1.

Current JPIs need to be reviewed on their added value. SRIAs of valuable JPIs should serve as input to define 'societal targets'.

As the JPIs have been set up to tackle societal challenges and the grand challenges of Horizon 2020 are global, a logical conclusion could be that addressing these challenges is a common and joint endeavour that deserves to be (partly) funded by the framework programme. However, it is of great importance that the current JPIs and the societal challenges be revisited and assessed to analyse whether progress has been made and whether there is a need for new societal challenges to be addressed, or a current one to be abandoned. The JPIs have organised themselves in doing foresight activities, consulting stakeholders (also societal) and producing long-term R&I agendas and roadmaps, namely SR(I)As. These SR(I)As can constitute an important source of information – taking into account some quality control procedures – for distilling a number of common, indispensable activities, topics and actions ('must do'), which we call 'societal targets' (or missions) to address (parts of) the challenge and hence to be funded by the FP9 budget. (cf. section 6.1)

Societal targets can serve as focal points with which activities of stakeholders and instruments can be aligned, provided the right incentives are being put in place.

Other actors (RPO or even individual researchers) can align their R&D&I efforts to these societal targets and additionally support complementary ('nice if done') parts of the roadmaps or strategic agendas. Actors could be stimulated by the Commission to align their activities. Extra networking/coordination support can be distributed via COST (a higher grant), by specific CSAs and dedicated ERA-net projects with a higher (more significant?) financial contribution by the Commission, etc. In addition, governments (and RFOs) could co-define the priority challenges or prime societal targets (see above) and can decide i) to co-fund (either by means of their own national/regional funding or by ERDF funding – cf. section 8.1) complementary activities through joint programming activities/instruments, ii) to align the activities of their research centres with these societal targets, iii) to provide back-up funding for good proposals that could not be funded by FP9 only i.e. a kind of virtual common pot extension of the FP9 real common pot budget and using the FP9 rules, not national rules), or to align national/regional instruments.

Project portfolio management will be a key component.

Crucial in such a configuration is project portfolio management⁹ and links between the various instruments (cf. also sections 5.5 and 6.1). Dedicated EU officers, complemented with competent Member State representatives and external experts, should have a bird's eye view on the various projects and their outcomes to determine how these can contribute to other projects (e.g. from block 2 to a block 3 societal target) or how these could proceed to a higher TRL (e.g. from block 1 to block 2). As already mentioned, close-out meeting reports might be a valuable tool for them.

⁸ Notwithstanding the effort required to conduct broad consultations, the number of (paid) advisory groups should be kept within reasonable limits.

⁹ This differs from the current use of portfolio management by the Commission in Horizon 2020, where a portfolio of projects proposals around a topic (possibly spanning multiple calls) is managed. In our proposal, on the other hand, a portfolio of selected projects results is managed to better 'steer' their transformation into effective innovations. Both approaches seem to be complementary.

2.4 Structure of FP9

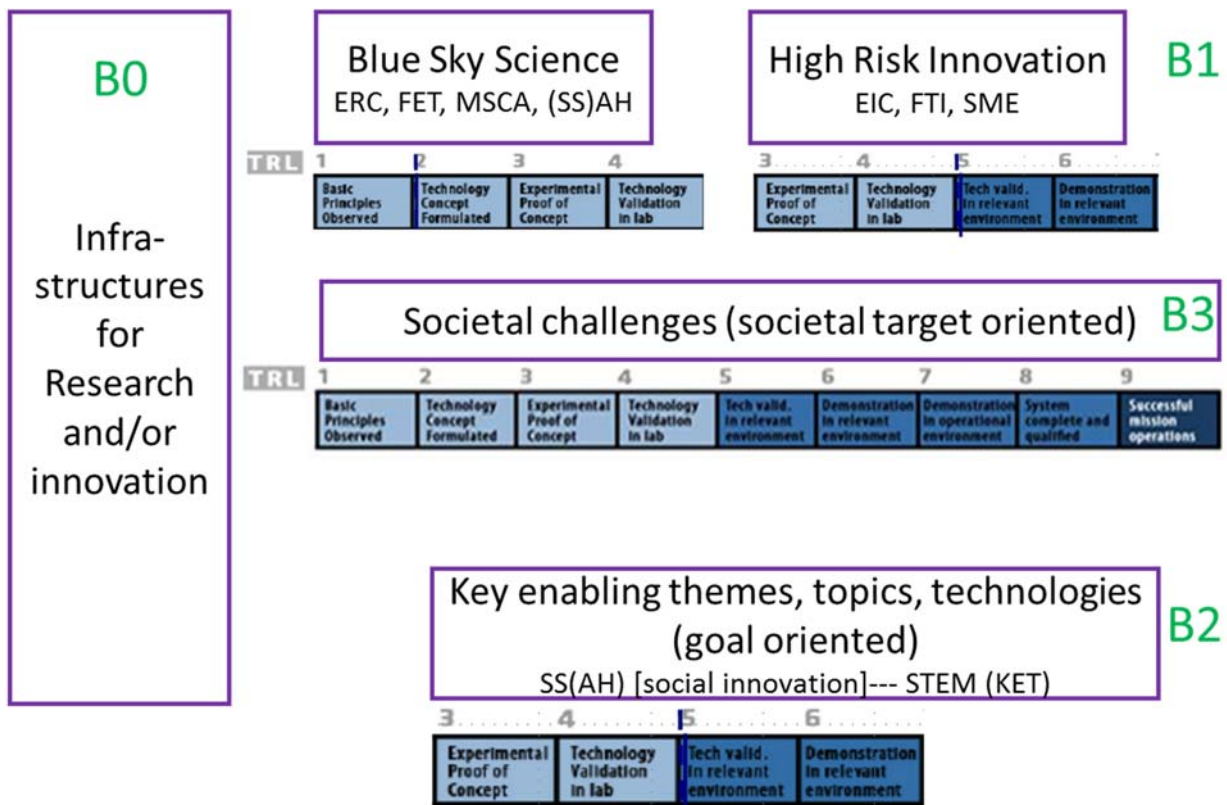


Figure 3: proposed structure for FP9

An improved structure for an improved programme that runs for ten years.

Figure 3 outlines our proposal for the structure of FP9, which is based on the Horizon 2020 structure. The Horizon 2020 structure could benefit from some changes to accommodate some important concerns and opinions mentioned above. Given the vision and ambitions explained above, Flanders favours an FP that runs for more than five years, by preference ten years. The mid-term review of the FP should effectively result in a partial reorientation of the challenges and as such guarantee flexibility in the vision and priorities. Flanders favours two-year work programmes except at the start (the first year) of the FP.

Block 3: societal challenges are the backbone of FP9 and cover the whole TRL range.

As the figure shows, the societal challenges (block 3) are the backbone of the FP9 covering the entire TRL range. As results are obtained, the targeted TRL range for a call or project gradually moves from low to high over the FP9 lifetime: projects can be active – according to the participant profile – in several TRLs at the same time. E.g. universities can cater for the lower TRL activities while companies for the higher ones. Where the focus lies, depends on the call. This implies that successive calls can address the same subchallenge or that calls can address in parallel different TRL ranges.

Broad involvement of stakeholders and civil society is needed. JPIs constitute a prime source for scoping papers and work plans. Societal targets could be defined to bring more focus into the programme.

As it concerns societal challenges, any (kind of) societal stakeholder is invited to provide an opinion, which will be taken into account to draft the scoping documents and work plans. As JPIs have produced a long-term SR(I)As for their respective societal challenge, these SR(I)As provide an important source of input into the scoping papers and work plans. As not all can be covered within the FP, it is particularly important that national governments and funding agencies also take their responsibility and provide means for co-funding activities (e.g. by means of ERA-nets CoFund). An alternative way to go is to define 'societal targets' within FP9. These concern more concrete intentions/ambitions to solve specific aspects of societal challenges that impact on the life of European citizens. Some regularly provided examples are: a plastic-free society; how to organise sustainable energy storage; or how to support the transition to precision medicine. The process of defining societal targets could be organised as a co-creation process between JPIs, Member States (via the ERAC GPC ?), the Commission and other societal stakeholders (cf. also section 7.1).

Block 0: research and innovation infrastructures.

Block 1: blue sky science and high risk, market creating innovations

The Horizon 2020 pillar 1 'excellent science' is broadened towards disruptive innovation by including the EIC (see the earlier Flemish position paper). Also the scope of research infrastructure is broadened towards research & innovation infrastructures and is a block in its own right (block 0) as it should also be functional towards block 3. Block 0 has to work in close cooperation with the European Strategy Forum on Research Infrastructures (ESFRI) and EIC.

Block 2: leadership in enabling innovative topics, themes and technologies

Horizon 2020 Pillar 2 (Industrial Leadership) is reduced and widened at the same time. The FTI instrument is to be moved to the EIC. The 'Leading Enabling Technologies' are expanded into 'leading enabling innovative topics, themes and technologies', thus creating additional space for non-technological forms of applied research and innovation (cf. section 5.2). A relevant example of non-technological but nevertheless relevant innovative topic-driven research concerns the migration and integration topic. It is to be expected that social sciences can strongly contribute through research on migration issues and other forms of policy advice, possibly leading to technological innovations as well. The main goal of block 2 is to support incremental technological and social innovations that can be deployed in many different settings, including (but not exclusively) in high TRL projects of block 3.

2.5 Links to other programmes

Project portfolio management as a tool to foster synergies between programmes.

The new FP9 has several possibilities of interfacing with other programmes. The project portfolio management team should not only keep an eye on how projects could move up 'the TRL stairway to solutions' within block 3, but it should also look for opportunities to 'spin out' FP project results to other funding opportunities (such as COSME - Europe's programme for small and medium-sized enterprises – or the European Investment Bank (EIB)). In addition, funding may be attracted from non-FP instruments to (co-) fund activities within the FP. In particular, to co-fund innovation infrastructure (in the new block 0) financial instruments of the European Fund of Strategic Investments (EFSI) could be useful, or alternatively subsidies by the Connecting Europe Facility (CEF). Already, Member States are financing large research infrastructure through ESFRI. There should also be a strong link from block 1 – more specifically the EIC – towards the more elaborated financial instruments of the EIB.

Many Commission programmes provide a good opportunity for synergies.

Directorate-generals of the Commission other than DG RTD, such as Agriculture (DG AGRI), Energy (DG ENER), Transport (DG MOVE) and Communications Networks, Content & Technology (DG CNECT), could reserve a certain percentage within their proper budget specifically for FP9 activities, in addition to funding already

allocated to the FP from within the multiannual financial framework. This holds true in particular for the societal targets, where results from the FP can be further developed by programmes of other DGs.

There remain practical obstacles to better synergies between FP and ERDF, such as timing of calls, different rules, state aid rules...

For certain countries, the use of ESIF funding seems very appropriate to complement FP funding – e.g. the Commission promotes the use of ERDF funding for the Seal of Excellence given to SMEs that have successfully passed the evaluation of the FP SME instrument. Nevertheless, the following practical obstacles and mismatches need to be overcome:

- Differences in timing of FP and ERDF calls - If ERDF and FP funds are to be used simultaneously there needs to be a synchronisation of FP and ERDF calls
- Differences in type of funded activities and actions - If ERDF and FP9 funds are to be combined, the objectives and targets of the different funds need to be aligned
- Lack of harmonisation of rules (differences in composition of partnerships, differences in cost models and reporting requirements, ...) - Different and often more stringent rules are imposed on ERDF, preventing complementary use and synergies
- A revision/simplification of state aid rules is needed so that the application of state aid rules in ERDF is compatible with both the FP and ERDF. In addition, state aid rules should be applied/interpreted consistently in all EU countries¹⁰
- High expectation versus limited funding - Alternative funding through ERDF using the 'Seal of Excellence' approach might create high expectations among applicants while funds available in Member States are actually limited
- Lack of communication between the Commission and the regions responsible for funding applicants having obtained the Seal of Excellence, possibly resulting in false expectations
- A Seal of Excellence is easy to attribute to mono-beneficiaries, but is much more complicated to apply to multi-beneficiaries, and sometimes even impossible if only ERDF is involved.

Dedicate ERDF budget to FP R&I activities.

Much of these obstacles would be easier to overcome if the EU member states would allocate a separate and fixed part (e.g. 10%) of their ERDF R&I budget to FP R&I activities to create synergies, e.g. via Seal of Excellence-like schemes, or ERA-Net Cofund-like programmes (cf. also section 8.2).

Continue to support Eurostars.

The **EUREKA** programme that facilitates both individual bottom-up projects and Cluster programmes remains an attractive and flexible support instrument for the business sector. Therefore, continued support for the Eurostars Joint Programme (art. 185) that is built on the complementary relationship between the European R&D instruments (FP) and those of the Member States' instruments (via EUREKA) is needed.

Defence research cannot come at the expense of R&I FP funding and should be managed separately.

At first sight, the new **European Defence Action Plan** (EDAP) might offer opportunities that justify a link with the FP9. However, it is currently not yet clear how 'compatible' both programmes will be. Given the more confidential nature of the EDAP, it should be kept outside the FP as a separate programme with its own objectives and procedures (including their own funding instruments, programme committees, evaluation boards).

The FP is supposed to use as main governing principles the ERA roadmap priorities, which seem less appropriate for a defence programme (in particular the 'open' aspects). In addition, funding instruments and research topics are likely to be more tailored to the purpose and future use of the results – e.g., particular rules regarding innovative procurement or the involvement of military staff in the programme committees and evaluation boards– so that it is more effective to set up and tailor a separate programme rather than to integrate it – with lots of exceptions to the general rules– under the umbrella of a general

¹⁰ Alternatively (or complementary), a consistent interpretation of state aid rules is guaranteed by the Commission for all EU states.

research programme. Results of the FP will probably spill over to the EDAP (dual use) but it remains to be seen whether ideas and results will flow in the opposite direction as well.

Most importantly, EDAP funding cannot come at the expense of R&I FP funding. The EDAP has to be organised separately from the 9FP, each programme having its own logic, governance, rules, instruments and budget.

3 Research & Innovation Infrastructure

[Block 0]

Research and Innovation Infrastructures should function as a supporting block for all the other parts of the programme.

Flanders believes that the research infrastructures should be broadened towards research & innovation infrastructures and should become a block in its own right (block 0) as it should also be functional towards the other blocks. Block 0 has to work in close cooperation with ESFRI. The 'Infrastructure' area as well as successful instruments such as the integrating activities, e-Infrastructures activities for existing research infrastructures, design studies for new research infrastructures and construction of new infrastructures or major upgrades of existing ones must be maintained. ESFRI could finance pan-European (open) infrastructure that is more typical for innovation than for research.

Flanders supports the aim of the Commission to further develop and more widely use RIs at EU level and beyond. Flanders is convinced that a European approach to the construction, use and management of RIs will contribute to improving Europe's research and innovation potential.

A better linkage with industry, enterprises and regional innovation ecosystems is needed.

Flanders is in favour of a better linkage of research infrastructures with industry, enterprises and regional innovation ecosystems. Better integration of research infrastructures will create more and better opportunities to co-finance, collaborate and invest in community and network building by all types of actors. A better synergy with companies, whenever relevant, without jeopardising the integrity or the scientific quality of the research, is to be aimed at in future calls for proposals, in the design of projects as well as in the governance. Co-funding by ERDF may further stimulate the development of infrastructures for innovation. Good links with the EIC should be maintained as well.

Demonstration infrastructures deserve special attention.

Essential for many innovation projects to bridge the valley of death are large-scale pilot and demonstration infrastructures. A new instrument should be developed to provide the appropriate financing mix for these kinds of infrastructures, of which the construction costs are often non-bankable.

4 Excellent and disruptive R&I [Block 1]

4.1 General

ERC and EIC should go into one block.

The excellent science pillar of Horizon 2020 is to be extended by an excellent innovation counterpart. Next to the ERC that supports cutting edge, bottom-up fundamental research, an EIC should fund the most innovative and high risk projects (also bottom-up) by grouping the most important innovation funding instruments that were scattered over different parts of Horizon 2020.

FET Proactive is a good practice for determining research themes.

The open consultation system of the FET Proactive can be retained as a good practice to determine in a bottom-up and transparent manner important and relevant research themes. The role of the PC in this scenario evolves more into a process quality control committee, in particular regarding openness and transparency (cf. also section 7.1).

4.2 Excellence in research – Blue Sky Science

Funding research to tackle future societal challenges.

The research funding programmes under the first block provide a strong foundation of excellent scientific research throughout Europe. European Research Council (ERC) grants encourage Europe-wide competition and attract research talent from outside Europe. Marie Skłodowska-Curie Actions (MSCA) stimulate mobility with the goal of gaining necessary new knowledge, research and networking skills which are all vital for a research career in or outside academia. Future and Emerging Technologies (FET) enable trans-sectoral and transnational cooperation, also for major topics that need a long term funding base. Also Social Sciences and Humanities must be included in block 1 work programmes as proper topics on their own.

Peer reviews based on excellence are central.

Bottom-up, pioneering and curiosity-driven research leads to solutions in which excellence prevails and Europe's competitiveness can be strengthened. A professional peer review system that uses excellence as the main criterion must therefore remain. Peer reviewing has to be coherent, transparent and harmonised, and must take into account the epistemic and scientometric specificities of each scientific discipline. Additionally, Flanders insists that the peer reviewing process of interdisciplinary (basic) research projects should be conducted by a team of truly interdisciplinary peer reviewers.

4.2.1 ERC

Strengthen the ERC.

Flanders supports the strengthening of the ERC within FP9. Curiosity and creativity are the main driving force leading to frontier research. Radically innovating technologies are based on scientific research. ERC also maintains a remarkably low level of management overhead and has demonstrated ability to improve its own operating mode.

Ensure a good proportion between the different types of grants.

There should be good proportionality between ERC grants that are funding curiosity-driven research and the proof of concept type of ERC grants - though the latter are very valuable with regard to the valorisation of basic research. These grants indeed aim at establishing the innovation potential of ideas through funding activities such as technical validation, market research, clarifying the IPR position and strategy or investigating commercial and business opportunities.

Scientific excellence should be the only evaluation criterion applied by the ERC.

Flanders supports the aim of ERC to lead to publications of the highest quality and to the commercialisation of innovative ideas. The ERC programme should not use criteria other than scientific excellence, in particular because the ERC funded curiosity-driven research is not meant to lead directly to the application of innovative technologies and ideas nor to include commercialisation perspectives. The evaluation of the ERC itself should consider aspects such as the effectiveness, good governance and low overhead besides scientific impact.

4.2.2 Future and Emerging Technologies

The bottom-up principle of FET is its strong point.

The Future and Emerging Technologies (FET) is much appreciated thanks to its science-driven approach in the small and large-scale collaborative research proposals. FET Programmes proved to be a good way for both research institutes and the private sector to work together on an equal basis. In fact, the bottom-up principle of the FET scheme is very much appreciated.

We support the current way of determining the topics of FET Flagships.

FET Proactive is entirely bottom-up and researcher driven. FET Flagships are a good instrument for national/regional governments and funders to co-design and co-finance ambitious and promising projects in fundamental and strategic basic research. As only a very limited number of topics can be funded, due to their size, a strong selection mechanism is to be put in place. Ultimately the national/regional funders will decide which topics will be funded. Nevertheless, the selection process should start with a completely open call for expressions of ideas and interest.

4.2.3 Marie Skłodowska Curie Actions

We support MSCA.

Both the strong focus on career development and fair treatment of researchers and the link between research and innovation make MSCA a very valuable programme that has a structuring impact on the research community with a view to consolidating it for the future. For a suggestion regarding 'mobilising excellence'¹¹, we refer to section 8.2.

¹¹ Which is our new term for widening.

4.3 Excellence in innovation – High risk, market-creating innovation

EIC should be bottom-up and focus on excellent innovation projects.

The EIC with the Fast Track to Innovation (FTI) and SME-instrument as major instruments, should focus on supporting projects with excellent potential to create innovations. The excellence criterion for projects does not refer to scientific excellence here, but to strong innovative capabilities, including high risk and high gains. The EIC should support projects with a strong potential to induce important positive economic or societal impacts and with a clear plan on how to realise this potential. Such excellent innovation projects can focus both on incremental and breakthrough innovation. Excellent innovation projects can include both technological and non-technological/societal innovation aspects. EIC should be the main bottom-up channel for scaling-up excellent innovation projects and helping them through the valley of death. In doing this, the EIC should decrease the current complexity and support accelerator effects for such highly innovative projects.

Ensure good links between ERC, FET and EIC.

If the EIC comes into effect, results of the FET-instrument – in particular FET-open calls and FET-flagships, which are aiming at ambitious (breakthrough) R&I projects but targeting FET projects at lower TRLs – and the ERC projects which have received an ‘ERC – proof of concept’ grant, can be picked up. A good link between the ERC and EIC on this account is essential. Nevertheless, the FET Open instrument as such should not be managed by the EIC as very probably the TRLs would be increased compared with the actual situation resulting in fewer opportunities to submit bottom-up, cooperative blue sky research projects. Such projects have an important innovation potential. The results of these lower TRL projects can be taken into account in follow-up project funding and can be an important step in closing the innovation gap (cf. also section 2.1). Calls of the ‘FET Launchpad’ instrument can support this link between blue sky research and highly innovative proposals. Consequently, this instrument can move to the EIC. Also interesting project results from block 2 and 3 might ‘migrate’ to the EIC, subsequent to close-out meetings during which a high (disruptive) innovative potential has been identified by the FP9 project portfolio management team.

5 Leadership in innovation [Block 2]

5.1 General

Fund knowledge and technologies 'to make the future'.

The second pillar, which in Horizon 2020 consisted of five leading industrial technologies, an SME instrument and a financing instrument, is broadened to better include social/societal innovation and the SSH in general (cf. also section 7.3) in the FP9. As stated earlier (cf. section 2.2) the content of this block is determined in a top-down manner. Foresight exercises and/or future scenarios describe upcoming trends and potential futures, which enables identification of the basic enabling knowledge and technology that is needed to 'make the future'. E.g., research on artificial intelligence (using big data and analytics) and the Internet of Things is needed for a future society where humans can interact with all their interconnected domestic devices by voice from a nearby or a remote location. Another example, in the SSH realm, could be that research is needed for a society where citizens have a direct impact on how they are governed and how laws are voted, in particular on the European level. Proposals in block 2 mainly address goal-oriented research to develop in-depth themes, topics and technologies that are deemed relevant for the future. Although the immediate aim is not to solve a societal challenge, but rather to broaden the knowledge and technology basis, spill-overs from and to other blocks are desirable.

Hence, the LEIT component (Leadership in Industrial Technologies) is replaced by 'Leadership in Enabling Innovative Themes, Topics, Technologies' (dubbed LEIT3 – cf. section 5.2).

The SME instrument should go under EIC.

Regarding the LEIT SME instrument, the EIC could manage the SME instrument favouring spill-overs to other EIC instruments. In the context of the LEIT3, the EIC should also support incremental innovations for technologies deemed important next to its bottom-up instruments that focus on high-risk, disruptive innovations (cf. section 4.3). We tend to favour such a combined approach (cf. section 5.4).

The financial instruments should cover all blocks.

As regards the 'Access to Risk Finance' instruments, we propose widening its scope to all blocks although the gravity point might still be block 2 (cf. section 5.3) as supporting SMEs in their scale-up phase in particular should clearly remain a main target. Additional and boundary-spanning efforts should be undertaken in order to break down existing obstacles preventing investments by equity funds and investment companies in new and disruptive innovations.

Simplification for enterprises is a must.

In general, the funding landscape for enterprises should be simplified as next to 'regular' Horizon 2020 calls, also JTIs, cPPPs, ERA-nets, ... can organise calls. Some use the metaphors of 'spaghetti' or 'jungle' to describe the situation, which seems to be mainly beneficial for consultancy companies that assist applicants in writing up their proposal, but at significant cost to the actual applicants, especially SMEs that do not have this expertise in-house.

5.2 Leadership in Enabling Innovative Themes, Topics and Technologies

The five current KETs need to be reviewed and, if necessary, updated.

The Horizon 2020 programme defined five key enabling technologies, namely ICT, nanotechnology, advanced materials, advanced manufacturing and processing and biotechnology, which were deemed crucially important to Europe's industrial competitiveness. As stated above, foresight/future exercises should determine which trending topics and technologies we should invest in, and hence whether or not to

maintain these five technologies as such. It could be expected that also one or more societal topics are added to the list – e.g. increased knowledge on migration.

In LEIT3 activities more weight should be given to higher TLRs than in activities within the framework of the Excellence block.

5.3 Access to risk finance

Improve the EU VC market.

Flanders stresses the importance of removing fragmentation in the European market of Venture Capital, and creating bigger ticket sizes including institutional investors. Fund mechanisms should be further stimulated in order to finance start-up and scale-up companies.

More awareness raising is needed.

More promotional efforts and visibility of the added value of leveraged financing are considered necessary for mobilising fund managers, national/regional promotional and commercial banks. EIC should step in here as a facilitator. This visibility is also important for the indirect SME beneficiaries to find the most suitable (possibly direct) financial instrument (equity or debt financing) at the EIB and to mobilise SMEs, start-ups and scale-ups to benefit from the increased financing possibilities. In this regard, promotional activities should also cover funding opportunities from COSME and EFSI programmes.

The Commission should communicate well in advance the timing of available EIB financing and the top-up possibilities via the Structural Funds (SME initiative), in order for the managing authorities to be able to assess ex-ante the added value of including financial instruments (such as guarantees, ...) in the ERDF operational programmes. These options are often unclear and information comes at a stage that is too late to provide benefit.

Consider novel forms of financing, such as crowd funding.

Novel forms of financing could be considered, in particular crowd funding. Crowd funding could mobilise additional funding for activities within the societal challenges and/or initiatives under the umbrella of Responsible Research & Innovation (RRI), in particular citizens science. This might help to involve societal actors (such as not-for-profit NGOs) who usually have a weak financial basis in projects that tackle societal challenges. Conversely, such organisations are usually driven by a large and committed community that is very interested in project outcomes and willing to promote and apply them – if possible – in their daily life.

Financing for demonstration and pilot projects is essential, but the choice should remain with the participants.

It is important at EU FP level to be able to provide a continuum of financial advice and support throughout the innovation trajectory. This also includes financing instruments for demonstration and pilot projects. Complementary to subsidies and grants, the financial rules of the new FP could stimulate the use of loans, guarantees and equity as alternative forms of support, but at the choice of the participants. Even though e.g. it is highly unlikely that participating HEIs in block 1 activities will use a financial instrument, it might be interesting for private partners involved in a project at the higher TRL range to use a financial instrument rather than a funding instrument. Inevitably, the choice of the instrument (funding vs. financing) will impact on the risks incurred, the IP arrangements and possible profits, which might hamper the 'open' aspects of FP.

5.4 Innovation in SMEs

Support for scale-ups is necessary to overcome the European innovation paradox.

SMEs are the engine of the EU economy and play a pivotal role in developing innovative products and services, and create or develop transition and new emerging markets. Any action targeting SMEs and/or potential unicorns always has to take their most important concerns into account: public funding instruments are (1) usually perceived as complex and (2) not always generally known, in particular which ones are the most appropriate; and, (3) often not available at the 'right' time.

The European innovation paradox remains one of the major challenges to be addressed by the new FP: in this regard, increased attention to supporting scale-up businesses within Europe is needed. The EIC could offer a solution by managing in the first instance instruments that stimulate at an accelerated rate innovations of a disruptive nature (as part of block 1, bottom-up) while not excluding incremental innovations (as part of block 2, technology-oriented).

Keep the integrated link between innovation and business services through the Enterprise Europe Network.

On the other hand, the SME instrument innovation support services in its current form in the Horizon 2020 programme adequately combines innovation and business services, with the Enterprise Europe Network (EEN) in a central role and, mainly by facilitating consultancy to help an SME bring its new product, service, business model etc. to the market. It would be counterproductive if the integrated link between innovation and business services and related experience established in the EEN were no longer available and/or if the EEN were no longer involved at a satisfactory level.

Support for market uptake activities is needed.

Beyond the demonstration phase, activities for a market uptake should benefit from a more integrated approach, including the funding of activities with forms of support other than grants, such as access to risk finance and other financial instruments (equity, debt) during market uptake. Flanders welcomes all the efforts already undertaken in this direction and is particularly in favour of further capitalising on the success of the SME instrument services introduced under Horizon 2020. The subsequent phases (currently 3) and cut-off dates of the whole cycle could possibly be optimised for better servicing the funding and financial needs of SMEs and a better response to equity.

Stronger focus should also be given to themes like clustering, standardisation, public procurement and intellectual property.

Optimise the SME instrument to show real EU added value respecting the subsidiarity principle.

In general, the EU added value of the SME instrument, as it is mostly a mono-beneficiary instrument, has to be safeguarded. It must be more than a mere replacement for a lack of national funding, but present real possibilities for increasing international linkages, global scaling up, etc. for its applicants who remain nevertheless rooted in their national/regional innovation system. In particular, we have doubts about the added value on financing feasibility studies at EU level, which ideally should be supported at the regional/national level in virtue of the subsidiarity principle.

Mainstream the SME Innovation Associate pilot.

An interesting instrument for addressing local skills shortages is available from the SME Innovation Associate pilot in the Horizon 2020 pillar 2: funding for assistance and training is provided for a one year appointment of a researcher from abroad within an SME to bring an innovative idea into practice. The target group of this instrument could be broadened to not-for-profit or other mainstream society organisations to support social/societal innovation. This might also offer an opportunity to strengthen the involvement of SSH researchers in the entire FP as NGOs often cooperate with SSH researchers (cf. also section 7.3). In that sense, this instrument would be of use mainly for block 3 (and managed by the EIC).

5.5 Coherence with ‘related’ instruments

PPPs should work in a more transparent way.

Currently, the Horizon 2020 Programme leverages investments of private sector and member states by matching funds in external semi-independent entities. This however generates ‘opaqueness’, (perception of) closed clubs, non-harmonised (evaluation) procedures, and complexity, especially from the viewpoint of newcomers and small entities. Calls or funding opportunities by these PPPs, both Joint Undertakings (Joint Technology Initiatives) and contractual PPPs, should be easier to find and announced within the participant portal, together with networking and call topic development opportunities.

5.5.1 Link with JUs/JTIs

JT’s/JUs need to be evaluated according to a pre-defined metrical evaluation framework.

A significant part of the FP budget is allocated to the Joint Undertakings (JUs), which are an important instrument for private sector participation and deployment of innovation in the EU. Although the initial goals were to strengthen European industry and increase private investment in the respective sectors, the net outcome of the JUs has been a matter of ongoing debate. Some JUs are doing better than others at this point. It is clear that a long-term commitment is needed before an impact may become visible. However, not all the JUs currently have an accountable evaluation system with SMART KPIs in place. Before consideration of follow-up funding or the establishment of new JUs under FP9 can be made, such an accountable and metrical evaluation framework should be a prerequisite, taking into account the specificities of each JU. For JUs that were launched in FP7 or Horizon 2020, an impact assessment report should justify their continuation with demonstrated outcomes in line with the objectives and tested against the outcomes expected according to the council legislation and other documents that contain the main rationale for setting up JUs.

A bigger voice for public partners is needed. The Commission needs to take up its role better.

If the JUs are to continue under FP9, an appropriate return on public investments should be guaranteed with new applications or outcomes to the benefit of society. Some JUs (e.g. BBI) have such a system in place, others (e.g. the JU FCH¹²) have initiated efforts to this end. In participating, public partners should not be in a merely advisory role but should be included as mature and equal partners to establish true PUBLIC-Private Partnerships. The practice of the current and previous FPs should be terminated with the public partners contributing financially but assuming mainly an advisory role, while the private partners take the lead and take the actual decisions. The argument that the party who brings the budget and knowhow has the leading role, applies to both sides. The Commission representing the public partners in the governing boards does not sufficiently, transparently and unbiasedly represent the Member States. The Member States’ role in the JUs should be pronounced and not merely advisory.

Better involvement of SMEs, academia and clusters is needed.

In addition, stronger efforts should be made to increase the participation SMEs, midcap companies and clusters in the JUs. Among other things, the governance structure of a JU, especially the industry grouping, should allow (and facilitate) the participation of SMEs, midcap companies and national/regional associations. It seems that in practice smaller countries with important research activity but restricted industrial presence are disadvantaged. If matching funds by private participants are no longer pooled at the programme level but at the project level, a joint undertaking might become a highly ‘particular undertaking’. Also, the involvement of academic project partners and other relevant stakeholders may be broadened. In particular, JUs should maintain close links with research happening at lower TRLs as it is important that industry maintains its competitive edge, knowledge base and absorptive capacity.

¹² The FCH JU will soon launch a study to make an inventory of the needs of regions and cities to decarbonise their society and subsequently develop business cases and a portfolio of technological solutions to answer these needs in close cooperation with the European Fuel Cells and Hydrogen industry.

Back to basics: JUs should leverage new private investments in the EU.

The JUs should return to their original reason of existence, i.e. to visibly leverage or increase private R&D investment and deployment in the EU. In addition, JUs should focus more on disruptive innovations and the creation of new markets, than on incremental steps forward that do not generate sufficient return on investment for society as a whole. In-kind contributions from entities outside of the EU are allowed, but should not be included in the in-kind calculation. Only European contributions that are shown to be genuinely new investments should be considered as this was the goal of the initiatives. Investments from outside the EU should however be positively evaluated and when follow-up support of projects is to be taken into account. In addition, partners contributing from outside the EU should be granted access to results and outcomes under certain conditions, and may be the main partner to bring solutions to the market. In particular, when Brexit becomes a reality, some of the major industrial entities may be outside the EU, although for strategic reasons this principle may not hold for any third country.

All JUs need to finalise with close-out meetings.

Projects from the JUs should be finalised with close-out meetings, a process established in the IMI JU. Availability of close-out reports may justify follow up calls or other initiatives to ensure continuation or sustainability of project outcomes and results. As outlined elsewhere, a combination of close-out results¹³ from different projects across the FP may open new opportunities to move results up the TRL ladder and result in bringing more innovative solutions to society (cf. also section 2.2). As an alternative/complementary “tool”, a project user group with actively involved stakeholders can also provide input on how to continue/sustain/exploit ex post project results.

5.5.2 Link with EIT

The recommendations of the European Court of Auditors should continue to be implemented.

Flanders underlines the importance of continuing the EIT (European Institute of Technology) as a distinct initiative encompassing the triple helix as well as the knowledge triangle and covering the entire innovation chain through its (Knowledge Innovation Communities) KICs. The recommendations formulated by the European Court of Auditors (ECA) in its EIT’s performance and compliance audit conducted in 2016, are already taken into consideration but this process should continue its course. According to the ECA, the EIT has to undergo significant legislative and operational adjustments in order to tackle the complexity of its operational framework and its management problems so that it can actually become the ground-breaking innovative institute it was originally conceived to be. In that sense, we expect that governance structures are now ready to function (and no longer require expensive consultancy to set up). As a result of its unique feature of encompassing the knowledge triangle and the entire innovation chain, some potentially overlapping areas of activities with JTIs and regular FP calls should be cleared. The EIT-KICs should also be assessed against a set of KPIs. And as for JPIs (cf. section 6.1.2), more common ways of working are recommended.

The EIT’s reforming measures should include an amended (i.e. more transparent and less complicated) funding model, a more efficient and transparent governance structure (including redesigning the EIT’s major decision processes), a better – both strategic and organisational – interactional alignment between the EIT and the KICs, clearer identified and more impact-oriented Key Performance Indicators (and better ways to monitor and analyse them), and a clearer positioning of the EIT in relation to the EC and also to (the) FP(9).

The latter also coincides with the overall (and since FP7 throughout Horizon 2020 pursued) objective to establish and strengthen synergies between the FP and other (R&I-)related European (funding) programmes and initiatives such as the ERDF (cf. Stairway to Excellence). This includes not only ‘synergies through (strategic) collaboration’ (e.g. application-driven EIT-KICs using pilot capabilities developed within FP) but also ‘synergies of funds’ (e.g. leveraging EIT-KICs strategies through ERDF funding). Synergies through

¹³ Cf. footnote 7

(strategic) collaboration could stimulate valorisation and market take-up of FP results by the EIT-KICs, whereas synergies of funds could improve the long term (financial) sustainability of the EIT-KICs. In addition, EIT-KICs also have to take up a role in spreading excellence (cf. section 8.2).

Focus on consolidating the existing KICs.

Apart from possible new EIT-KICs, assuming that additional EIT-KIC calls (beyond the already scheduled call in 2018) will be launched, the focus should remain on consolidating and further developing the six existing EIT-KICs. These KICs (and the EIT in general) should be given sufficient time by policy makers to deliver what is expected of them (and they should be evaluated on their deliverables in due course correspondingly), while their impact could be broadened significantly by disseminating best practices to the whole of Europe and not just towards the (appropriate) EIT-KIC partners. In case of clear (potential) added value and also to avoid possible overlapping EIT-KIC areas and/or activities, cross-KIC collaboration calls could be considered.

Consolidation can happen in particular at the reporting level. Currently each KIC has to use another reporting system with its different features, requirements and time lines. Using the FP participant portal and the FP9 reporting rules would align the reporting duties of the EIT-KICs. At the same time, the granularity of the reporting could be made the same as for regular FP9 projects, which would constitute an important simplification.

6 Societal challenges [Block 3]

Use a broad definition of innovation.

FP9 activities should cover the spectrum from research to market, integrating innovation activities, cross-disciplinary approaches, and socioeconomic and humanities research. Research should lay the foundations of technological and non-technological developments that are beneficial to societies as a whole and to the citizens' daily lives. Flanders is strongly in favour of a broad concept of innovation that includes not only technological innovation but also non-technological, social, institutional, organisational and behavioural innovation. Innovation could also refer to new developmental pathways towards sustainable societies, taking account of systemic constraints including societal transformation capabilities. Leaving a wider space for non-technological innovation will encourage cross-disciplinary approaches and involvement of the Social Sciences and Humanities.

A new scheme for collaborative R&I for longer-term impact, spanning all TRL levels (from idea to solution) over recurrent calls to effectively address societal targets.

Block 3 should focus on effectively creating new fundamentals and new ideas as well as on transforming these into 'solutions' for society. We propose a scheme for collaborative R&I for longer-term impact via recurrent calls for proposals to address societal targets (cf. section 2.2), harvesting ideas and transferring them to innovations and achieving impact at the same time. The calls should focus on a description of the targets to be met, and should be sufficiently broad (but sharper delineated than the current grand challenges of Horizon 2020), allowing for any solution. By a clear determination of the target, the expected impact is 'SMARTly' defined at the same time.

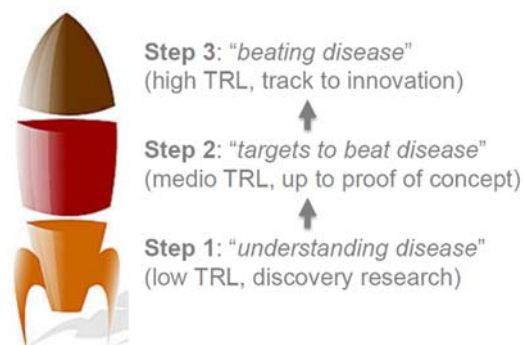


Figure 4: The LERU 3-step "rocket"

Such broad topics or targets would call for collaborative projects at any TRL¹⁴ (cf. section 2.2), possibly in parallel. A priori budget distribution between low, medium, and high TRLs depending on the goals to be achieved for collaborative projects across the entire innovation pipeline might be defined. Expected impacts in these targets are clear, achievable, and differentiated between low, medium, and high TRLs. Projects should aim to move up one or more TRLs. A call can harvest a bundle of projects in low, medium, and high TRL at the same time. Consortia can embark on any level – start from a new idea, promising a new solution for the target, or bring a previous proof of concept closer to impact or solutions for the target. Consequently, in addition

to research and innovation actions (RIA) and innovation actions (IA), research actions (RA) are needed as well to support cooperative and multidisciplinary research consortia (at the lower TRLs).

Repeating calls and competition under such a societal target within two or three years (depending on the topic) will allow low TRL projects to present their results to other consortia in the next call, which in turn take the results to medium and high TRL. Alternatively, the consortium can invite specific innovation actors and compete again for a higher TRL project, thereby taking the initial results to the next level. Also the FP project portfolio management team can intervene as matchmaker or 'guide' (using close-out meeting reports). This way, promising projects results should be selected, given funding to be transferred closer to use and hence generate the desired impact. The LERU idea of a 3-stage rocket (cf. Figure 4) is another way of representing the evolution from idea to solution (even if used in a slightly different setting). Only projects with a positively evaluated close-out meeting are allowed to progress in the pipeline (cf. section 2.2).

¹⁴ We continue to use the notion of TRL although in the context of societal challenges, a purely technological indicator is too limited. Currently research is done on what are called Society Readiness Levels.

Cascading calls might be needed to bring ideas to the market.

A variant¹⁵ of this scheme is inspired by the ERC where a project can evolve into to a proof-of-concept phase. A proof-of-concept grant is only secured when preceded by an ERC grant. It would ensure that projects with a higher TRL potential develop and continue up the value chain.

Assessments to analyse the progress made should help to change the focus or address new societal challenges or targets if needed. Assessment should also include reflecting on whether the projects funded really contribute to adequately addressing the targets related to the challenges. Underperforming initiatives should be discontinued.

6.1 Links with Joint Programming

The existence of JPIs should not evolve into an end in itself, but JPIs should focus on the societal challenges that can only be solved by joining forces across national boundaries.

6.1.1 Strategic

Better link up of JPIs and FP.

As stated earlier, Joint Programming Initiatives (JPIs) and other forms of joint programming, should be linked to the FP as they are addressing more or less the same global challenges. This should not negatively impact the ability of the JPIs to act on their own if needed. JPIs do not need to be fully integrated in the FP, but better connection/interaction/harmonisation would be achieved, as the FP societal targets can be considered as more sharply delineated, more concretely described in terms of output and impact, etc., parts of a longer term, broader, global SR(I)A as drafted by JPI. JPIs would be able to submit, as an entity¹⁶, proposals in response to calls by the FP to address specific societal targets in parallel to continue to develop and achieve the goals of their SR(I)A with national/regional funding by their supporting members. Alignment between JPI R&I activities funded by EU Member States and the FP R&I activities would happen in an organic way, as opportunities arise, rather than in a top-down administratively controlled way. Coherence between Joint Programming activities in general and the FP will be strengthened and the FP societal targets with the greatest JP participation will probably be those that can have the greatest European added value.

Ensure sustainability of JPI results.

In addition, outcomes of JPIs should be evaluated and if valuable, measures should be taken to guarantee sustainability (e.g. data repository). Too often resources are developed during a project, but cannot be maintained once it has ended. Assessments that are carried out during project close-out meetings, also taking into account results of other FP instruments, could help to select the most 'valuable' project results.

Based on assessments, it is possible that JPIs as a structure might evolve in different ways. E.g. some JPIs might focus on their foresight and roadmap activities without actually organising research calls anymore.

¹⁵ Some argue that, statistically speaking, it is impossible that a project could climb up the entire TRL ladder from idea to solution due to the combined low success rates at each proposal stage. Hence, a more protective two-stage project might be more effective.

¹⁶ We take ESFRI ERICs as an example, which can act as a consortium and compete for funding as a single organisation. Some JPIs (e.g. Oceans) are currently setting up legal entities.

JPIs should not cannibalise the FP funding.

Joint Programming should never be implemented at the expense of existing European (FP) research funding. On the contrary, the goal of Joint Programming should be to make the existing Member States' research more effective through better collaboration and coordination. This is a lesson learned from the JP Neurodegenerative Disease pilot programme, where a decrease in funding of ND research was observed in FP7.

JPIs can be used as a step-up towards FP participation.

Besides addressing global societal challenges jointly, Joint Programming might also take up an additional (but equally important) role of 'leading' R&D&I actors towards the FP. In its current form, most of the JP activities (in particular the ERA-nets CoFund), are not so highly selective as the FP. Many of the JP participants state that they consider JP activities as a kind of 'step up' towards the FP as they get acquainted with other European R&D&I actors and can build up a European network. Adding this goal explicitly to the JP rationale (with JPIs as a prime 'channel') might stimulate Member States to invest more of their local funding into joint programming (and R&D&I in general). As JPIs in particular work with long-term SR(I)As, funders might be 'reassured' that investing in these matters will be beneficial to their local actors in the long run, especially if the SR(I)As are also an important source of information to define the FP societal targets of block 3 (cf. section 2.2). In the context of 'mobilising excellence' and the mobilisation of ERDF funding, this 'step-up' role of a JPI might become useful (cf. also section 8.2).

6.1.2 Practical

Streamline rules for the different joint programming.

An opportunity for simplification can be found at the interface of the FP and the various initiatives on Joint Programming, such as the calls issued by the JTIs, JPIs and other co-funding activities, and mainly (JPI-related) ERA-Nets CoFund. A multitude exists of externalised agencies and entities (management boards), all with their own administrative and management overheads, usually resulting in separate procedures for call topic design and selection of projects, and less transparent funding streams, especially to big industry. The current instruments allow too many degrees of freedom so that each particular instance of such an instrument can organise itself (procedures, rules, calls, forms, monitoring, reporting, ...) differently, which greatly confuses (and even frustrates) the potential applicants and funders. E.g. each ERA-net CoFund can decide to distribute the top-up by the Commission in a different way, and each time the RFOs have to renegotiate the same issues with a slightly different outcome. More ideas on how to achieve a better organisational coherence are described in section 5.5.

Set up a Joint Programming Agency to simplify rules.

As the Commission is expected to work in partnership with the Member States on the societal challenges, other forms of support could be envisaged that may increase efficiency, effectiveness and coherence. Taking EUROSTARS as an example, a common submission, administration, evaluation and monitoring 'JP Agency' could be a significant step towards simplification of organising and handling calls as similar procedures, rules, forms etc. would be applied for any call.¹⁷ Funders would still be able to use the virtual common pot financing model, but it would no longer be necessary to each time bicker about details on the use of top-up funding, IPR and other rules, set up websites to advertise the calls etc. In particular, the overhead around ERA-Nets CoFund would be significantly reduced, while applicants would benefit from a harmonised set of procedures for announcing calls and evaluating applications. The costs for the JP Agency could be shared (e.g., membership fee) by the Member States and the Commission.

Establish a Joint Programming House to lower administrative burdens and improve interactions.

¹⁷ Alternatively, the possibility of Eurostars organising JPI calls could be looked into.

Alternatively (but also complementary) the Commission could redesign its way of supporting the JPI activities. In Horizon 2020, almost all JPIs were granted one or two CSAs to support the JPI secretariat and other management-like and coordinating activities. This process is not efficient as the JPIs have to spend considerable time on writing these proposals¹⁸ and, if needed, organise some 'transition funding' to bridge the period between two CSAs; being a partner in a CSA creates extra overhead due to the reporting demands. Some JPIs are now in the process of establishing themselves as legal entities that have to engage and manage their staff, accounting, housing, etc. It would be more efficient and effective if the Commission could set up a 'JPI house' offering housing, basic legal services, etc. at the same place instead of giving money to each JPI for the same set of activities. It would also facilitate the streamlining of many (management) processes within the JPIs, such as monitoring and impact assessment, which in this case could be done more or less in the same way.¹⁹ Most probably, the total costs of housing would become cheaper too and certain services (personnel management, ICT, outreach, PR, ...) could be pooled and when located in Brussels, have opportunities to interact with various other initiatives.

Make more use of innovative procurement tools in the framework of JPIs.

As JPIs also cover the high range of TRLs, the instrument of innovative procurement is very relevant to them. Horizon 2020 currently supports innovative procurement: not only by issuing innovative procurement calls, but also by providing for co-funding for innovative procurement calls by Member States. Next to budgets allocated to public sectors such as e.g. ICT, security, energy, healthcare, transport, ... that are strategic for competitive EU market developments (block 2 – cf. section 4.3), demand-driven close-to-market R&I fulfilling needs of JPIs could be addressed more through 'public procurement'. The instrument of public procurement is thereby extended as a strategic innovation supporting and stimulating policy tool. Also, joint public procurement could be stimulated and implemented with more of an eye to increasing public (inter)active involvement and a political 'buy-in' to the Joint Programming process in general and/or programmes of the new European Defence Agency.

¹⁸ And each time a JPI has to come up with some new aspects of its coordinating activities to acquire funding.

¹⁹ E.g. many JPIs are currently organising internal courses on how to implement impact assessment, and the result will be that each JPI reports on impact in a different way.

7 Governance issues

7.1 Involvement of EU citizens

Offer a voice to citizens on the desirability of socio-technological evolutions and societal challenges.

Many citizens in the EU seem to have lost their faith in science, facts, science-based policy-making and even the EU in general. One of the potential causes may be that the EU, science and innovation policy-making and the FP in particular, are hardly related to their daily problems and lives. Complementary to current efforts on communicating on the results of R&D&I funding by the EU and to the current discussion on impact (both of which are ex-post), involving the EU citizens ex ante, at the moment of defining the policies etc. has not yet happened on a large scale (cf. section 2.2), even initial attempts happen under the label of 'citizens science'.

We suggest involving the EU citizens in the definition and choice of preferred societal challenges FP9 has to tackle. A project, quite similar to the Bohemia Project, can be defined that has the specific aim of having EU citizens engage with one another through a huge Delphi survey on the desirability and preference for one or other future scenario (and its backchaining implications). Alternatively, groups similar to the G-1000 could be set up in EU countries to discuss future scenarios. Or, as has been done by the Netherlands, some large-scale survey on what the citizens consider to be the most important questions R&D&I has to answer. This exercise starts with an analysis of other sources of information, such as reports by expert groups, national policy makers, strategic agendas by the JPIs (cf. section 0) etc. and lets the EU citizen debate on the various options. Eventually, the Commission makes the synthesis (as the FP is a means to implement (parts of) the political visions of the Commission) and translates this into high-level descriptions of societal targets to be tackled by the 9FP and to be politically validated by the European Council in order to achieve the involvement of national/regional policy makers for complementary or aligned and/or co-funded actions (e.g. via the JPIs – cf. section 6.1.1).

7.2 Role of programme committees

Add more transparency to the current system.

A more transparent procedure of defining the different work programmes would be welcomed. All relevant stakeholders – advisory groups, expert groups, each PC's own supporters in their respective Member States – should have the opportunity to deliver input in advance directly and give feedback during (open) consultations, and have open discussions on the content (at the initiative of the Commission).

Nevertheless, trust in the cascade system that exists now should be given as well. National Programme Committee (PC) delegates should ensure timely dissemination of information to national stakeholders²⁰ and continue their coordination and steering role. In addition, the PC remains the concertation platform among Member States and with the Commission for discussing how the FP performs. In essence, a PC monitors, and if needed, adjusts its work programmes, while striking a balance between the interests of the various national delegations and their own stakeholders for the sake of the originally defined goals.

Assure quality and respect for procedures and supervise the Commission's work

However, as we propose a change in the overall structure of FP9 – cf. our proposal in section 2.2 – some aspects in the role of the PC also change accordingly.

1) As we propose that the FP9 Block 1 (excellent and disruptive R&I – cf. section 4) is basically driven by the curiosity of researchers and proposals for disruptive innovations by companies, the corresponding PC will function in essence as a quality ensuring committee which guards that all

²⁰ This concerns information regarding the preparation of the work programmes etc., not the more practical issues and information related to proposal submission, which is the realm of the NCPs.

procedures have been appropriately, transparently and adequately applied by the Commission. If some thematic orientations are to be provided, transparent and bottom-up mechanisms (as is applied in the Horizon 2020 FET Open calls) are to be put in place.

2) The PCs of the new block 2 in our proposal (cf. section 5) resemble best the PCs of Horizon 2020. The content of this block is determined top-down (using foresight exercises). The role of these PCs is to supervise and amend the translation by the Commission of the high-level strategies and priorities into specific scoping papers and work programmes according to the high-level vision on the evolution of what are considered as key enabling themes, topics and technologies. By all accounts, the PCs should restrain from adding too many details or thematic/technological restrictions in order to have applicants responding to the calls enjoy a sufficient degree of freedom that truly allows for innovative, creative and disruptive proposals.

3) Block 3 represents the target-driven societal challenges solution pipeline (cf. section 6). On the basis of a 'citizens' Delphi exercise', so-called societal targets have been defined and prioritised (cf. section 7.1). Block 3 PCs are supposed to supervise and amend the specific intervention logic for each of the targets as summarised by the Commission and their subsequent translation into work programmes (including repeated calls – cf. section 6) by the Commission that leads to the accomplishment of each target. Depending on the number and nature of a societal target, a PC could oversee multiple targets, monitor their progress, adjust matters if needed to keep them on track towards the expected results and impacts, and guarantee the open and transparent character of the entire process.

4) The PC for block 0 (R&I infrastructure) on the other hand must have tight linkages to the ESFRI committee and the other PCs as the infrastructures should serve the activities of the other three blocks on the one hand, while on the other, the Member States provide the funding for the ESFRI infrastructures. In addition, the block 0 PC should follow up the activities regarding the European Open Science Cloud that also imply aligning resources by the member states and the Commission. Using the stated sources of information, the PC for block 0 specifies in which areas or domains proposals for new RIs can compete to fund their preparatory phase and prioritises a limited number of specific actions for improvement, extension, targeted overhaul etc. of existing RIs with a high EU added value.

7.3 Social Sciences and Humanities (SSH)

SSH should be an integral part of a broad range of projects.

SSH should not be serving as a mere 'add-on' to a STEM project or an additive to technological oriented research. Instead SSH should rely on a robust science base in those projects in which SSH can broaden the discussion, bring new ideas and address complex global challenges which cannot be simply solved by technological improvements.

SSH-projects should also be funded in their own right and not always as part of bigger projects.

In our proposal for a new structure for the FP (cf. section 2.2), there is room in block 1 for SSH as block 1 functions in a bottom-up way (curiosity driven). We expect that proposals from the Humanities will be mainly submitted to block 1. In addition, more applied research (probably more the social sciences) is for block 2 (e.g. on the theme of migration), while in block 3 all disciplines (hence compulsory also SSH) are to be addressed in multi- and cross-disciplinary proposals.²¹ E.g. arts, design, architecture, linguistics and social work can play a very important role in developing new approaches and solutions to societal challenges.

The variety of the SSH domain needs to be acknowledged.

²¹ EARMA distinguishes between SSH inclusion (what corresponds to "our" SSH involvement in pillar 3) and SSH lead (what corresponds to "our" SSH as proper topic or theme in pillars 1 & 2).

From the above it also follows that SSH is not a monolithic block but a combination of social sciences and the humanities, which are further subdivided into various other research areas. Consequently, when drafting scoping papers and work plans, or when evaluating proposals and projects, experts from different SSH domains are needed. This is particularly relevant in a multi- and cross-disciplinary context. Without a core involvement of the SSH community in the framing, the resulting calls and proposals (even if flagged as SSH-relevant) will lack the flexibility to support the inclusion of SSH. Furthermore, if SSH is not explicitly contextualised in the impact statements, proposers will not be encouraged to include SSH collaboration in the design and implementation of their proposals.

Probably, the intensity of participation of SSH researchers in a consortium in block 3 will depend on the main topic of a proposal and/or which TRL range the proposal aims at. E.g. when working on new drugs, proposals researching new ideas will probably mainly involve partners from the life sciences domain, although it might be relevant to include from the start certain aspects on how to administer the new drugs, which could be investigated by SSH researchers.

8 Horizontal issues

8.1 Regional connectivity: 9FP and ERDF

More synergies between FP and ESIF are needed, but without adding to complexity.

To create a more efficient, effective and cost-reducing innovation system in general, Flanders would welcome more investment in finding synergies between FP9 and the ERDF Operational Programmes of the regions according to their smart specialisation strategy. However, guidelines and actions with this purpose should not add more complexity (cf. also section 2.5) nor worsen a lack of transparency in the Research and Innovation landscape, to avoid disincentivising applicants from applying for funding.

Synergies should go beyond Horizon 2020 and ERDF.

Synergetic opportunities depend on the ERDF budget levels, which strongly vary among EU regions. Therefore, we welcome guidance reports to put in perspective the regional specificities for finding synergies at programmatic and thematic/strategic level, not only limited to FP9 and ERDF, but also including other initiatives depending on the region and its policy preferences as well as its R&D&I / budgetary capabilities, such as the Health Programme of the EC DG Sanco, the Life + programme from the EC, DG Environment, etc.

The regional dimension needs to be better integrated in the FP through an effective multi-level governance model that combines policy levers at different levels.

Regions are the proper actors to address innovative ecosystems. Regionally developed ecosystems connected across Europe could be the driver of new European value chains. This requires the development of a stronger multi-level governance model, combining policy levers at different levels to reach shared goals. The regional dimension is not only a matter for Cohesion policy. Involving the level of European Regions more in the FP does not imply that the main principles of the FP are modified: calls or other initiatives are still organised on a competitive basis where support goes to the best proposals without any other geographical or political 'tweaking' (cf. section 2.1).

Mixed funding approaches are needed.

This new approach to funding also calls for the development of a fresh approach to synergies between policies. New management rules must be developed to allow mixed funding of innovative projects from different sources (public/private, EU, national, regional funds), tools, domains, and across regions (cf. also our proposal for a 'mobilising excellence ERA net', section 8.2).

Inter-clustering activities need more support.

Support for bottom-up inter-clustering activities could be reinforced. Moreover, regional innovation clusters should be considered as privileged partners in a number of European initiatives. Some dedicated funding for those approaches should find their place in FP9 with a view to fostering co-investment projects on a bottom-up basis, but with a clear link with industrial policy priorities. An example of such a transnational cluster is the Vanguard Initiative 'New Growth through Smart Specialisation'.²² Even from such a regional perspective, FP support can only go to the best initiatives and proposals (cf. section 2.1).

²² This network of 29 innovative European regions strives to be a frontrunner in the application of smart specialisation as a strategic principle in European innovation and industrial policy to promote new growth through a bottom-up dynamics in the regions (<http://www.s3vanguardinitiative.eu/>). It focuses on the joint development of networks of demonstrators and pilots to accelerate market development.

8.2 Mobilising excellence

Flanders believes that applying the principle of spreading excellence and widening participation in the FP towards less R&I performing countries to close the innovation divide is a worthy endeavour. However, the main principle of the FP, a pan-European competitive selection based on excellence, cannot be watered down by adding corrections of a geographical or financial nature (cf. also section 2.1). In addition, Flanders does not want to integrate widening measures by geographic criteria in the evaluation of proposals in any part of FP9 other than those parts specifically foreseen for widening actions. Rather, several, complementary measures are to be taken to offer equal opportunities on a stairway to excellence to any newcomer to the FP from any EU Member State or associated country.

Excellence is a driver of structural reform.

The European Commission should not underestimate the structuring effects of its principle 'competition for excellence': countries, regions, and individual institutions want to reach a comparable level of excellence and hence start their own policy reform. Stepping away from the principle will again slow down this process. Hence, instead of using the term 'widening', we prefer to use 'mobilising excellence'.

Use ERDF for 'catch-up' or 'back-up' financing.

If countries or regions need support to 'converge', the most appropriate instruments and funding are to be found in the ERDF programme (cf. section 2.5). Precisely due to this fundamental difference in goals, both programmes have different (financial) rules and procedures, which makes it difficult to combine funding of both sources in the same project. On the other hand, ESIF-ERDF does offer sufficient possibilities to allocate funding that complements FP funding. Consequently, the responsible local authorities managing the ERDF funds need to actually decide to use ERDF funding as back-up for FP money.

Dedicate ERDF funds to Seal of Excellence projects.

A currently popular way to 'back up' lacking FP funding is the use of the Seal of Excellence, which is attributed to excellent proposals but not fundable through a lack of FP funding with the idea that national/regional funders step in and fund the proposal nevertheless, being assured of its quality by the Seal. In more and more cases, the Seal of Excellence is also being considered as the solution to the widening problem (e.g. by making use of the 'capacity building' funding under ERDF). Nevertheless, it is not a silver bullet for mobilising excellence in general.

An ERA-Net Cofund for Excellence could form a new approach, combining FP and ERDF funds.

Hence, we propose to investigate the possibility of combining FP funding with ERDF funding and local funding through an adapted, excellence-mobilising ERA-net CoFund. The starting idea is that one of the positive effects of an ERA-net is to introduce new or young R&I performers or actors otherwise not or less connected at European level to relevant networks of potentially interesting project partners. The research performers themselves experience participation in an ERA-net as an easier step-up and learning process towards the highly selective and competitive FP. As EU-13 researchers complain about the difficulty of entering what they perceive as closed networks leading up to consortia of FP proposals, the ERA-net CoFund instrument seems to be a good tool for opening up these networks and/or establishing new ones. In addition, the ERA-net CoFund instrument, in a slightly adapted form (see below), has the features available to combine various funding flows, in this case FP and ERDF funding and local funding. Some principles are listed below:

- ERDF funding may be used as national/regional input in a virtual common pot system: in the same way as national/regional funding rules apply, ERDF funding rules can be followed and do not conflict with FP funding rules because they operate at another level (applied to project consortia vs. the ERA-net funders consortium).
- FP funding is used to (partly) support the network costs (as in the former FP6 ERA-net style): this provides an incentive to potentially interested funders (and is easier to apply than the unit cost

system). In return, the consortium of funders is obliged to organise a minimum number of calls for projects (to be negotiated).

- DG RTD and DG Regio have to agree about ‘relaxing’ certain financial and procedural rules to facilitate an efficient and effective functioning of such a variant of an ERA-net CoFund. E.g. this ‘ERA-net ERDF CoFund’ should also support fundamental research, allow for a more intensive support for infrastructure (more than 25%, including personnel costs to maintain the infrastructure), should not impose a restriction on the geographical adjacency of the participating funders, and the selection of the project proposals is to be done according to the ERA-net CoFund current practices, In short, the compatibility between ERDF and FP9 should be substantially improved (cf. also section 2.5).
- The decision to set up such an ERA-net CoFund in a certain area or for a certain topic is made by the relevant FP PC (through its work plans) while the actual content and funding decision regarding specific proposals are done mainly according to the ERDF rules.²³ This assures a good linkage (or synergies) between the FP and ERDF operational programmes content-wise. In addition, the ‘mobilising excellence ERA-net’ can also be deployed in the context of a JPI, which can function as another incentive for EU-13 countries to participate and contribute to the global societal challenges (cf. also section 6.1).

A similar reasoning might be applied to the MSCA-CoFund instrument, which would avoid the need to introduce all kinds of geographical checks and balances for this instrument.

Strengthen the NCPs.

Also, various initiatives to train the NCPs should be strengthened based on the ‘train the trainer’ principle (e.g., the NCP Academy). But it is also up to the Member States to take their responsibility in organising their local NCPs and achieving a good enough quality of service, which requires adequate resources for their local NCPs. The FP can help by organising under the hood of the Policy Support Facilities several mutual learning exercises on NCPs, and other issues relevant to ‘mobilising excellence’ issues.

Improve local infrastructure of promising research performing organisations

As infrastructure may play an important role in enhancing the attractiveness of individual research performing organisations (RPOs), another possibility is to use ERDF to support the creation of suited infrastructures at individual RPOs (e.g. new labs) that have a track record in one or more specialised domains (possibly linked to the regional smart specialisation strategy) and show sufficient potential for successful participation in FP9. It would induce a brain-remain and even a brain-gain effect.

Involve the EIT-KICs

Each EIT-KIC is supposed to design a regional innovation scheme to enhance the innovation capacity of modest and moderate innovating countries by transferring KIC good practice of the knowledge triangle integration. As this also applies to entities that cannot (yet) become KIC partners, RPOs from less R&I performing countries must be able to participate in EIT-RIS programmes and activities. The RIS roadmap of the various EIT-KICs must clearly (and SMARTly) describe which RPOs from which countries are eligible for participation. The number and quality of such RIS activities is to be included in the KPIs of each KIC, and should be regularly evaluated or monitored.

8.3 Responsible Research and Innovation

Make RRI a horizontal issue.

Societal aspects of scientific research have gained more attention through research done on the concept of Responsible Research and Innovation. The insights which have emerged over the years on the separate elements of RRI (gender balance, open access, open data and open science, public engagement and citizen

²³ To avoid that the consortium of an ERA-net ERDF CoFund only consists of ‘less R&I performing countries’, other countries which, by their characteristic of performing well on R&I, cannot ring fence a huge ERDF budget, can use their national/regional funding.

science, ethics and science education) should now be implemented and put into action. Therefore, a preference for the next FP goes out to taking up the elements of Responsible Research and Innovation as horizontal issues (as already happens for some of its aspects – e.g. gender) and not as a separate Science with and for Society/RRI work programmes. For specific research on RRI principles, specific actions as needed can be proposed in work programmes in block 2. RRI should also involve as much as possible all actors of society (quadruple helix).

8.3.1 Open Access/Open Data

Explore alternative business models

Alternative paths should be explored for the dissemination of scientific knowledge, that is, paths relying on the principle that researchers themselves should regain a stronger grip on the publication of their research results, and should systematically integrate the problematics of researchers' evaluation and the adequate choice of performance indicators in research assessment.

We are positive about measures taken already in Horizon 2020 to support researchers in drafting their data management plans (DMPs) for each research project, but insist that this activity be considered as a regular project activity so that the related costs can be claimed as eligible costs. However, for the sake of the cost effectiveness of the DMP submitted (and the budget of the entire research project proposal), alternative methods (e.g. the green road to open access) are to be preferred and/or the costs for gold accessed capped. In that respect, Flanders welcomes the effort of setting up and maintaining an OA repository via the FP, and recommends involving ESFRI channels as well.

8.3.2 Open Science

Exchange best practices on involving non-scientists.

We believe it is of the utmost importance to raise the awareness of the European citizens about the specificities of science, not only in its contribution to societal and technological innovation, but also – in a context of rising populist approaches - as an important method for better understanding the physical world and human societies alike. Therefore, more good practices should be exchanged at EU level about how to integrate non-scientists in the scientific process, from the common definition of the problem to be tackled to the dissemination of the research results outside of academia.

In addition, the following items could be integrated in the next FP:

- Adequate indicators of openness that go beyond bibliometrics should be developed and integrated in the monitoring of the successor FP.
- The stakes of the Open Research Data policies need to be clarified, as well as the requirements for applicants in terms of Data Management Plans.
- A better complementarity between FP9 and Erasmus + actions might be pursued in the fields of RRI, citizen science and science with and for society. Two main ideas are: 1) education is key to raise awareness of citizens with regard to science and innovation; 2) Open Education forms an integral part of the Open Science paradigm. As the EIT KICs also include education activities, the EIT KICs could also foster such awareness-raising activities.

8.3.3 Gender

Emphasise gender more, both in research funding as in programme governance.

To tackle the underrepresentation of female researchers in research and innovation projects, we need to emphasise more the gender dimension within the entire research context (e.g. in personal medicine, human-machine interface design, etc.) and within the entire governance structure of FP9. Besides the promotion of a thorough family friendly policy by the EC, the EC's Gender Equality Plans (GEP) should be taken into

account by the consortia. The combination of a research career with family responsibilities should be made easier. Financial burdens, impacts on job functions, types and opportunities related to parental leave, which is discouraging mainly for women, should be addressed. Also, the topic of gender in research should be further emphasised, because of the still existing lack of knowledge about possible gender issues in many research topics (from medicine to industrial design, etc.).

8.4 Internationalisation

Mainstreaming internationalisation has failed so far. A return to a specific internationalisation instrument should be considered.

To strengthen the European Research Area and make it more competitive and relevant in a globalising world, international cooperation with regions and countries outside Europe should be reorganised. Mainstreaming the international dimension in the overall Horizon 2020 programme has proven not to be very successful. Besides mainstreamed calls with a primarily content rationale that are additionally flagged as (optionally) international, a proper international instrument (Support International Coordination Actions - SICA) is needed that specifically focuses on target regions and/countries outside the EU. Consequently, it should also be clearly communicated towards the stakeholder groups whether international cooperation is mandatory or recommended. The ERAC SFIC should function as an advisory group that drafts joint roadmaps for international cooperation which are taken into account by the Commission when drafting the FP work programmes.

More specifically, the higher amount of transaction costs and environmental burden (e.g. to fly to the other side of the globe) should be taken into account when determining/deciding on the need or appropriateness of specific international calls.

And in general, international cooperation does not necessarily imply that joint programmes be set up, but can also mean that the EU is in the driving seat to draft research and innovation agendas as an expression of openness to the world that is continuously changing.

The UK should become our preferential third country partner after Brexit.

In a worst case scenario regarding the future way of cooperation between the EU and the UK, the latter should become the primary third country to be included in the internationalisation activities and flagged calls of FP9 to allow for a disruption as limited as possible of the existing co-operation between researchers in the U.K. and the rest of the EU. Naturally, the U.K. should respect the FP9 participation and financial rules and, most importantly, be prepared to fund the British participations. The U.K. should enjoy a preferential status over other third countries as potential EU partner for international co-operation. On the other hand, for the EU to remain attractive for the U.K. to co-fund the FP as a third country, some of the U.K.'s concerns should be met – apparently the primordial role of 'excellence' as main governing principle (cf. section 2.1).

8.5 Success rate / oversubscription

The low success rate needs to be tackled through various measures to retain the attractiveness of the FP

The oversubscription to certain instruments of Horizon 2020 clearly leads to a significant decrease of acceptance rates. There are various causes of this 'success' of Horizon 2020: more applicants in general, reduced funding at national level, more national incentives to submit to the framework programme as part of national policies, and higher quality proposals can be considered as the main factors. However, the tough competition, details in the proposal and/or the subtle differences between evaluators' performance have become too important factors that make the difference between funded and not funded proposals.²⁴ As a result, applicants potentially are no longer 'attracted' to submit a proposal to the framework programme as they perceive the evaluation process no longer as just and objective. In addition, the administrative

²⁴ Eg. How to prioritise (for an insufficient amount of funding) various proposals that have received a maximum score ? And how to justify a non-funding outcome to these applicants ?

burden of preparing and, in case of success, executing the proposal is sufficiently high to add to the dissuasive effect.

Various ways to tackle this problem should be applied, not only on the European level but also on the national level (mainly investing more in R&D, but this falls outside the scope of this document). Below, we group the most important ones.

- The two-stage subscription with a strict selection during the first stage should be the rule. One-step subscription should only be applied for calls with narrow scope (although we consider such calls to be an exception too²⁵) or for highly dynamic domains (e.g. disease outbreaks). A firm and effective selection during the first phase will result in fewer applicants invited to write a full proposal. We recommend trying to involve some evaluators of round 1 also in round 2 for the same proposal.
- The use of a dynamic threshold in stage 1 can be a good solution that results in lower success rates in the first phase with fewer participants who are invited to write and submit a full proposal. However, this instrument still needs fine-tuning, to avoid too little competition in the second phase (e.g. only 2 remaining projects).
- Evaluator comments must be fair, informative, sufficiently substantiated (corresponding to the type/length of proposal²⁶). ‘Diplomatically polite’ evaluation reports (not to scare away new applicants) should be avoided (as they are much too vague). Some proposals indeed have serious flaws and/or are not worthy of being resubmitted. This should be stated unequivocally.
- A disadvantage may be that a two-step-evaluation procedure takes a longer time-to-grant. It is therefore important to keep procedures lean and mean. As mentioned in section 5.4, for some instruments the stage 1 selection and funding could be done by national/regional agencies.
- A more generalised use of the Seal of Excellence (cf. sections 2.5 and 8.2) might be a solution at the ‘back-end’ by referring applicants to national/regional/ERDF ‘back-up funding’, although for multi-beneficiaries ERA-net- or EUREKA-like schemes have to be set up. In addition, various additional local checks will still be applied because of different rules and regulations, so the European added value of such back-up funding must be clearly justified (as applicants could simply try the corresponding national/regional instrument first). In addition, national/regional funding channels cannot simply be expected to become ‘extensions’ of the framework programme funding channels. Regional/national RFOs keep the discretionary power to decide on what to spend their budgets (and how). Nevertheless, the interplay of national/regional funding for JPIs that subscribe (via a proposal) to addressing the FP work plans that address societal targets (cf. section) could constitute an alternative way of mobilising additional national/regional funding to support the FP. Funding for proposals with a Seal of Excellence could also be provided by joint programming instruments (in the first place JPIs).
- For the ERC grants, restrictions on reapplications or a quality control performed by the host institution of the applicant could be considered.
- The current work programmes approximately indicate the expected size of project proposals. However, it is still allowed to submit projects of a different size. As a consequence, in some calls a ‘winner takes all’ effect is created: big proposals are submitted that take up (nearly) all the available budget of a call. This risks creating unfair competition, discourages other participants that stay within the suggested size and has a detrimental effect on the success rates. Clearly announcing an upper limit to the funding per project, except for exceptional well-argued cases, and, if needed, capping the size of accepted projects should put a stop to this practice.
- The perception of disillusion by the applicants could be mitigated by the use of two digits after the decimal point in the scores. This allows for a sharper distinction between otherwise ‘equal’ scoring excellent proposals. This could also allow for a finer use of the dynamic threshold where ‘rescaling’ of scores can be an option.
- Lastly, another way to raise the success rate is to lower the funding rate in the SME instrument. Based on experiences of the Flemish innovation and enterprise agency (VLAIO), private enterprises are not striving to maximise funding rates in innovation projects. Advantages thanks to the networking at EU level, including access to a broader knowledge and market as well as the

²⁵ Eg. for ERA-nets CoFund involving all relevant actors in Europe as has been the case in the domain of meteorological services and geological services.

²⁶ Certainly not consisting of merely one or two lines as has happened during Horizon 2020!

opportunities of attracting new and highly skilled knowledge workers, seem to be equally important and rewarding. Lowering the amount of funding available per proposal results in a higher number of proposals that can be accepted. A higher chance on a lower funding amount seems to be sufficiently attractive for enterprises and can be part of a solution to tackle the low success rates. In addition, a lower funding rate implies that proposals are not solely funding driven, but are 'rooted' in the actual business operations.

Annex

This position paper prepared by the Flemish department of Economy, Science and Innovation (EWI) is the result of the joint effort of many individuals whom we would like to thank for their effort and involvement. In particular, the EWI colleagues who are members of the thematic team on internationalisation and the members of the working group 1 (on Horizon 2020) of the EWI stakeholder platform on international policy.

This stakeholder platform brings together civil servants from the relevant Flemish governmental departments and agencies as well as representatives from all types of stakeholders (academia, industry, civil society) and official advisory boards to discuss issues related to international science and innovation policy with a focus on European issues.

In addition, many of them have brought other position papers (by national administrations or European stakeholders groups) to our attention from which we have selectively drawn ideas and formulations.

However, their individual contributions and involvement do not necessarily imply their (or their organisation's) consent on the entire position paper, precluding them (and their organisation) from expressing divergent opinions in other papers or at other occasions.

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