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on Establishment of Horizon 2020 - The framework Programme for Research and Innovation (2014 - 2020)

Committee on Industry, Research and Energy

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Science, research and innovation are the life blood of modern societies. They embolden the race for new knowledge and new opportunities and by seeking to provide answers for scientific and technological questions, they form the basis for economic growth and societal development. By pushing forward the frontiers of knowledge, by pooling together the sharpest minds to find answers for common challenges and by creating cutting-edge scientific and technological breakthroughs, investment in R&D and innovation is an essential tool for boosting Europe's prosperity and (re)shaping its future.

From FP7 to H2020

On 30 November 2011, the Commission unveiled its proposals for Horizon 2020, which integrates for the first time under a single Common Strategic Framework for Research and Innovation (i) the successor of the 7th Framework Programme, (ii) the current Competitiveness and Innovation programme and (iii) the European Institute of Innovation, combining two legal basis: TFEU articles 173 and 182 on industry and research.

This is a major doctrinal shift from previous science-driven FPs which responds directly to the condensed diagnosis on Europe's current situation made by the Commission in its opening lines of the *EU2020 Strategy* and which reads as follows: "the crisis has wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. In the meantime, the world is moving fast and long-term challenges – globalisation, pressure on resources, ageing – intensify".

For years now scholars have demonstrated the strong link between research, innovation and economic development and have consequently pinned the explanation for the underperformance of the EU to the weakness of this link. A further step has been the confirmation of the existence of an equally strong link between the research and innovation policies needed to improve competitiveness and the policies needed to resolve societal challenges. Both ideas have been developed in the *Europe 2020 Flagship Initiative Innovation Union* and provide the logic for the Commission proposed structure of Horizon 2020 around three priorities: excellent science, industrial leadership and societal challenges.

Welcomed novelties of the proposed programme compared to FP7 are:

- The integration in one single Programme of the whole chain of innovation, from fundamental research to the market;
- A stronger focus on major societal challenges, funding research and innovation to provide answers for (or to help coping with) concerns shared by citizens around the world such as climate change, affordable high-quality healthcare, food security or the scarcity of energy and clean water, to name but a few;
- A stronger focus on competitiveness in order to keep (and move) European industries up in the value chain;
- More opportunities for scientists to extend the frontiers of knowledge through an increase of bottom-up and cutting-edge projects;
- A stronger emphasis on multidisciplinary to create new added value;
- A broad scope of innovation policy, encompassing social innovation;
- A step towards simplification.

Specific topics for discussion

The new proposed architecture and features of Horizon 2020 address many of the recommendations and proposals made by Parliament in its recent resolutions (report Carvalho, report Audy and report Matias). However, your rapporteur considers that the entire proposal deserves a detailed discussion. In order to trigger the debate, your rapporteur has identified the following first set of issues.

A more ambitious budget

The *Europe 2020* strategy sets out a vision of Europe's social market economy for the 21st century and the EU budget should mirror this ambitious programme by making a shift towards funding future-oriented investments, such as R&D and innovation.

It is this kind of investment which makes sense in the current financial and budgetary crisis. In time of crisis, people need clear orientation points and investing in R&D&I provides exactly this type of strategic orientation: it sends out a message of confidence to the citizens, who see that the EU directly invests in improving their lives and tackling their concerns, while simultaneously creating and keeping jobs in Europe.

The proposed budget of 80 billion euro for Horizon 2020 seems at first glance like a considerable increase compared to the FP7 budget. However, one should keep in mind that the Horizon 2020 programme merges different EU programmes into one, that the range of activities is greatly increased compared to FP7 and that the funding of FP7 increased sharply over the years. In fact, the proposed budget for Horizon 2020 represents only a modest increase (around 6% in real terms) compared to the funding level of FP7 in 2013. This is not sufficient and falls short of the recommendation by the European Parliament to allocate 100 billion euro to this programme. Such a budgetary sum is needed to reach our ambitious EU2020 goals, to solve our grand challenges and to be the way out of the current economic crisis. In the past, the European Parliament has repeatedly taken the lead when it came to strengthen the role and importance of European research. In the current crisis it is vital that we do this again with courage and determination.

A more balanced budget

The Commission's aim in Horizon 2020 to provide a "seamless support for R&D and innovation activities" is a step in the right direction to ensure effective knowledge and technology transfer, but the right balance should be kept. Your rapporteur holds the opinion that the heart of Horizon 2020 should remain transnational, medium-size collaborative pre-competitive R&D projects, while more efforts should be done to ensure that the results of these projects have a real impact throughout the whole Union and are being used towards new products and services to help solve societal challenges and exploit economic opportunities.

Shifting the focus too much towards funding short-term, close-to-market innovation could come at the detriment of more long-term, fundamental research that often is the source of radical, disruptive innovation.

A clear example of change of balance in the Commission is the considerable budget increase

allocated to the EIT. It merits some reflection, for instance, that biotechnology, a widely recognised enabler of EU industrial leadership, is allocated virtually the same budget (EUR 575 million) as the EIT (EUR 500 million) receives just from the heading "Leadership in enabling and industrial technologies".

In order to better asses the internal balance of the proposal, it would be a very welcomed addition if the Commission would present an indicative breakdown whereby the allocations derived from each of the legal basis of Horizon 2020 (research and industry) would be clearly differentiated.

Furthermore, the FP7 trend towards outsourcing parts of the budget by creating partnerships has been accentuated in the current proposal. Whereas this option has the potential of achieving a higher leverage effect of the use of EU funds and responds to the logic of a better articulation of the European research landscape, we are currently facing a situation where many national research and innovation budgets are under considerable strain and the private sector is cutting back its investment. An overreliance on this kind of structures (PPP and P2P) might not be too realistic right now since we might run the risk that important parts of the Horizon 2020 would not be fully developed due to lack of Member States/private actor's resources or would just be undertaken by a few actors, giving way to further polarization of our science and technology base. In order to better grasp the magnitude of this trend, a rough indication of the budget to be managed by centralised direct management and centralised indirect management would also be welcomed.

Overall structure and implementation of Horizon 2020:

Whereas the division in three pillars has the merit of responding to three clear priorities, the mixture of instruments and objectives inside "Industrial leadership" could be confusing for participants. They could be left under the impression that "access to risk finance" and "innovation in SMEs" will not - or not to the same extent - contribute to the "societal challenges".

Regarding the "societal challenges", while their chosen themes and groupings seem to respond to the current global problems we are facing, there is doubt on the proposed combination of topics under the "inclusive, innovative and secure societies" challenge. The Programme could be better served with a subdivision between inclusive societies and innovative societies, on the one side, and secure societies on the other. Also, more emphasis needs to be put on the social dimension of science, especially on the contribution of all sciences to eradicate poverty and social exclusion.

The Treaty imposes on Horizon 2020 several simultaneous goals such as the structuring of the European Research Area, raising the overall level of EU science, enhancing competitiveness, finding solutions to societal challenges, etc. But goals without targets are only vague declarations of intentions, impossible to monitor, steer or evaluate. Following the good practice of EU2020, it could be discussed whether it merits to include within the body of this Regulation a selected number of quantified headline targets to assess the impact of Horizon 2020. As an example:

- Horizon 2020 will stimulate Europe's economic growth, generating XX percent of extra GDP;

- It will also enhance Europe's competitiveness, increasing its exports by XX percent, and reducing its imports by XX percent;
- It will create jobs for Europe's citizens, increasing employment by XX percent;
- XXX research organisations and XXX enterprises, of which XX percent of SMEs, will take part in its activities;
- XXX entities new to the FP will participate;
- XX patents will be filed;
- XXX researchers will receive further training;
- XX percent of funds will be coordinated with Structural Funds.

Finally, the proposal as it stands is considerably vague in many parts and leaves a great deal to be defined during the implementation of the Horizon 2020 via the annual Work Programmes. This is especially true for the "cross-cutting actions" and has some implications for the internal allocation of the budget within and between the three priorities, which could be altered during the Programme's lifetime without too much regard for democratic accountability. Therefore, we should ask ourselves how Parliament could give the Commission adequate political direction on what it sees as the right balance between these approaches and if Parliament should ensure a stronger and more pro-active involvement for itself in overseeing the implementation of the programme.

Widening participation: excellence and competitiveness

The establishment of the European Research Council is having a positive influence on the excellence of research and researchers in Europe and the Commission is therefore right to suggest doubling its budget. However, creating and nurturing excellence in Europe should not lead to a research/innovation-divide in the EU, which is not only an unwanted consequence *per se*, but it also risks eroding the support for a substantial EU-budget for R&D.

The Treaty is also clear on this point when referring to the objectives of the EU's research and technological development policy "the Union shall, throughout the Union, encourage undertakings, including small and medium-sized undertakings, research centres and universities in their research and technological development activities of high quality".

It has been argued that less represented Member States should prepare for excellence by enhancing their capacities via the Cohesion Policy. And indeed the Commission's proposal on the new EU Cohesion Policy 2014-2020 develops this idea by strongly enhancing the coordination between the Structural Funds and the Framework Programme: it increases the share of the resources to be devoted to research and innovation activities, it includes as *ex ante* conditionality the presentation of national or regional research and innovation strategies for smart specialization (to be evaluated by DG Research) and allows, for the first time, to combine funding from both the Structural Funds and the H2020.

However welcomed this shift might be, it does not suffice. Horizon 2020 would need to include significant and concrete "bridging activities" in order to increase the numbers of researchers, institutions and territories participating in the programme, in order to spread excellence throughout the territory thereby optimising the economic and social impact of research. In the Commission's proposal there are some elements to bridge the innovation

divide under the "Inclusive, innovative and secure societies" challenge, but we should be more innovative in looking how to extend these bridging activities to other parts of the programme and make them more visible, more concrete and more relevant.

Human resources:

Without researchers we will not have R&D performed in Europe. The Commission has estimated that 1 million net additional researchers may be needed in Europe by 2020 to meet an R&D intensity target of 3% of GDP. What is more, we need our best young people to pursue a career in science, we need a diverse and gender-balanced workforce, we need to attract and retain the best researchers in the world, and we need to encourage our researchers to be inter-sectorally mobile. Yet, as the Horizon 2020 proposal underlines, only 46% of Europe's researchers work in the business sector, only 7% of doctoral candidates has been trained in another Member State and only 18% of full professors in Europe are women.

Given the paramount importance of the Marie Curie Actions (MCA) to address these issues, the disappointing budget increase for this specific action within the excellence pillar has come as a surprise. Neither does the budget allocation correspond to the results of the public consultation on the Green Paper, where more than two out of three stakeholders demanded a considerable increase of the MCA funding level. Parliament must not forget that the "stimulation of the training and mobility of researchers in the Union" is one of the four activities to be developed by the multiannual framework programme, as explicitly recognised by the Treaty.

On the other hand, for the Marie Curie and the ERC grants to yield results and nurture EU-wide excellence they need to be built in a continuum, starting upstream with measures focused at attracting young students to a scientific career and assuring downstream that grantees and the research teams built around them have a continuity within their research institutions after EU funding is over. Member States need imperatively to advance structural changes by granting better working conditions for researchers if we wish to reverse brain drain and assure the efficiency and effectiveness of EU public money. At EU level, policy actions need still to be supported in the new Marie Curie scheme in order to set a strong benchmark and push for a European Career Framework for Researchers.

Despite some significant advances in FP7 there is still a structural deficit which hinders our research performance: direct and indirect sex discrimination. In order to assure excellence and efficiency of our research and innovation budget we need to empower women throughout the scientific pipeline and the fact that Horizon 2020 has, for the first time, a whole article devoted to gender equality is a considerable improvement. In practical terms, this translates into measures like ensuring the participation of women throughout project lifecycles, keeping the 40% target for female participation in Programme and Advisory Committees and guaranteeing that researcher mobility measures incorporate the gender dimension.

Involvement of the private sector:

If we want to achieve the reaffirmed goal of the R&D intensity target of 3% and in light of the meagre 1.25% average R&D intensity in the business sector, more progress needs clearly to be made by our industry. A telling comparison is the weak 1.3% average growth rate of R&D

expenditure in the private sector compared to the 4% growth rate in the public sector (EU27) in the last 5 years.

Also in terms of innovation the trend is worrying. As the Innovation Union Scoreboard 2011 shows, a smaller share of today's SMEs, if compared to 5 years ago, has demonstrated an innovative behaviour either by introducing new products or new processes, and in most Member States the share of SMEs innovating in-house has been declining.

Likewise, the participation of the private sector in the Framework Programme has been showing a declining line. The Commission has rightly tried to reverse this trend in its proposal by either reinforcing or creating schemes for industry (both small and big) to participate in, such as PPPs, the new SME-dedicated instrument or the equity and debt facilities.

In general terms these instruments are welcomed, not only because they fill an important gap in our research and innovation landscape -this is especially true in the case of the debt and equity facility- but also because they are designed to provide support for the whole value chain and each stage of the enterprises' life cycle. Having said this, there is a general view among stakeholders that the implementation of the dedicated SMEs instrument will need further clarification.

One could also think of increasing the involvement of industry, and especially SMEs, in R&D projects by allowing for sufficient smaller and less prescriptive projects or for more flexibility in project management, incorporating more knowledge transfer activities in all R&D projects, creating a lighter administrative regime for small follow-up commercialisation grants, or organizing the appropriate innovation support structure on local level, while "tapping in" the already operating European R&D and innovation networks.

As for PPPs, including JTIs, we need to make sure they fulfil their objective of enhancing the competitiveness of the European industry while making the most of their genuine potential of unlocking private funds. In this sense, your rapporteur would like to put on the table the idea of agreeing upon a set of shared conditions applicable to new and existing PPPs by which (i) public funds should also be matched by a budgetary commitment from the private partners and not only by in-kind contributions, (ii) in principle the Framework Programme Rules for Participation should be applicable, especially in terms of IPR, access rights and open participation to newcomers and small players (iii) calls are subject to enhanced transparency (iv) they complement rather than replace the traditional transnational cooperative projects, i.e. the areas covered by PPPs are not automatically excluded from the Work Programmes, (iv) they are aligned with the EU R&D strategic agenda.

Simplification

Although this is a topic to be widely discussed in the Rules for Participation, your rapporteur would like to underline that simplification should go well beyond the reduction of the error rate in the programme's management and should respond to the demands of a more user-friendly approach in order to render research and innovation as open and easily accessible as possible to all potential beneficiaries.

More directly linked to the Regulation establishing Horizon 2020, simplification, as discussed above, also includes the harmonization of the rules and procedures across all instruments of this Programme.