A new role for EU Research and Innovation in the benefit of citizens:

Towards an open and transformative R&I policy

Policy Paper by the Research, Innovation, and Science Policy Experts (RISE)

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(Vice Chair and Members of RISE)

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1. Introduction

What's the problem?

The EU has a number of policy tools and instruments for addressing the supply side of R&I (i.e. Horizon 2020 and Structural Funds) but without a real explicit policy strategy steering them. There is actually no coherent policy framework putting the instruments into a context.

The instrument-led focus of EU R&I policy has hampered the impact of the significant investments made (see Box 1) because first, such programmes are disconnected from a broader policy purpose and thus lack a long-term stable approach; second, implementation thereby triggers conservatism and is open to pressure from interest groups; and thirdly, this deficit is unlikely to be detected as the assessment of performance ignores often the quality of outputs and real success.

While the move towards a challenge-driven approach in Horizon 2020 has been a good step forward, addressing now broader societal challenges, to have a real impact, such a programme will have to be truly "mission-oriented", fitting in as an integral part of larger policy objectives. To achieve this, R&I will have to be linked closer to the other EU policies, defining concrete missions in the realm of a broader EU energy policy, transport policy, environment policy, etc. In other words, what is lacking is coordination and synergies between supply and demand of R&I.

For this, the supply-side needs to be more mission-oriented, in the sense of engaging in resolute action addressing major societal challenges; while the demand-side must be smart, allowing disruptive innovations reaching out to the single market. Bottlenecks and the existing market framework may block disruptive innovation and prevent new innovation practices and business models to develop, for instance those responding to the sharing economy. A more focused demand-side policy would therefore address regulatory barriers and incentives for disruptive innovation. At the same time, open practices of research and innovation make it easier to inter-connect supply- and demand-side.

Box 1: Historical amounts are invested in EU R&I

- **Horizon 2020** - the world's largest R&I Programme with € 80 billion over seven years.
- An estimated € 120 billion to R&I from the **Structural Funds**
- The new **EFSI-fund** expected to contribute to R&I both directly but also indirectly with synergies with national/EU R&I initiatives
- The Council has adopted an **ERA Roadmap** as well as guidance for an **ERA new governance** structure (Competitiveness Council, 29 May 2015).

What needs to be achieved?

Ultimately, the challenge is now to show real impact, such as visible benefits for citizens and creating growth and new jobs, but also with respect to other policy goals. However, the impact will likely not be achieved if we do not go beyond the present pure 'project / instrument'-driven approach. Horizon 2020 may have been designed as a challenge-driven programme but we have no corresponding EU R&I policy and strategy which is challenge-driven.

RISE therefore proposes to go for an "open and transformative **R&I policy**, making Europe world leader in the new networked innovation economy, but geared towards the benefit of the citizens. This change will be an important part of a new EU R&I policy in the revised Europe 2020 strategy to ensure that the European recovery is sustainable, based on sustainable growth, knowledge-intensive society, not just the old growth model where productivity is achieved through cost reduction. The change has to include both the way priorities are set and the implementation of these priorities

Of course, this open and transformative R&I policy needs to take into account the ongoing changes in the economy. The economy of today and tomorrow is global; it is very much dominated by the interplay between multinational enterprises (stronger than many countries), disruptive 'born global' firms, and mobile highly skilled individuals. It is a networked society and a networked economy at a global scale, driven by knowledge, ideas, intangibles and the search for new forms of open and disruptive innovation that may give rise to novel types of business models. Whatever European policy is, it has to be situated as a response to this. These changes would also pave the way for the planning of the last years of Horizon 2020 as well preparation of the Framework Programme after Horizon 2020, where the Commission will have to put a forward a proposal at latest at the end of 2018.

In what follows, current instruments for the supply of research and knowledge will be revisited, as well as those on the demand side of R&I. We then present first elements ("work in progress") of a strategy to move towards a new approach for European R&I policy, which is complemented by a number of concrete suggestions for action.

2. Revisiting current instruments for supply of research/knowledge.

EU-policy[1] has always been a driver for EU-Research policy starting with the EURATOM-treaty in energy policy but it was not until the Single Act[2] where a legal basis was included in the Treaty setting out the objectives of the Framework Programme (articles 130f-q). With some modifications, these articles are still the legal basis for the Framework Programme.

The first five Framework Programmes[3] (FP1-FP5, 1983 - 2002) were mainly 'project-driven' with the aim to boost transnational cooperation and mobility in Europe – an aim which has certainly been achieved in many senses. The instruments used were mainly aimed at individual researchers.

FP6 and FP7 (2003 – 2013) took a step to a more 'programmatic approach' in order to meet the needs of the ERA, e.g. instruments to promote coordination of national programmes (ERA-NET and the use of articles 185/187). This approach extended the participation in the Framework Programme from mainly individual researchers also to 'programme owners'.

Partly in FP7, but mainly in Horizon 2020 we saw for the first time a 'policy approach' to the Framework Programme – in FP7, with a wider use of the article 185/187 (as well as the Joint Programming Initiatives), but foremost in Horizon 2020 with the Societal Challenge approach. The Lund-declaration from 2009 concluded: 'European research must focus on the Grand Challenges of our time moving beyond current rigid thematic approaches. This calls for a new deal among European institutions and Member States, in which European and national instruments are well aligned and cooperation builds on transparency and trust'. However still, the instruments used are mainly the same and not always tailored or anchored at national level.

Another aspect of the evolution of the Framework Programme is the priority setting – or rather the lack of priority setting. Hardly any de-prioritisation has been done. Instead the 'thematic content' has been extended in every Framework Programme and this has been possible through a constant increase in the budget. The present system encourages interest and lobby groups to pressure for continuity in terms of thematic content. The establishment of e.g. ETPs was a good step to get a more European coordinated approach but there is a risk of proliferation.

The article 187 (Joint Technology Initiatives) is mainly mission-oriented but focuses on industry rather than the public sector. Unfortunately the corresponding article 185 for the public sector has encountered numerous problems e.g. in the implementation. Although there are examples of many successful ERA-NETs they will most likely not reach the original aim of –coordinating national programmes at a 'larger scale'. Because of the complexity, the scheme has promoted the emergence of a number of 'professional funding agencies' specialising in implementing those schemes.

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1 See background paper: History of European Research and Innovation policy, Johan Stierna/Emanuele Barbarossa, DG RTD

2 OJ L 169, 29/6/87

3 Priority-setting in the European Research Framework Programmes, Dan Andrée, 2009 http://www.vinnova.se/upload/EPiStorePDF/va-09-17.pdf

The question of alignment of (national) priorities/programmes rather than focusing on funding transnational projects is most relevant but still lacks real political commitments, suitable instruments and tangible goals.

Finally on synergies between the Framework Programme and the Structural Funds; the Framework Programme is a top-down European programme where priorities and selection of projects are at European level and projects are transnational (or selected through EU-competition). The implementation of the Structural Funds is the opposite, where priorities and selection of projects are done at national/regional level and projects are normally national. Synergies between the two cannot be created at EU-level, but need to be realised at national and regional levels, starting with the agreed priorities set out in the legal acts of Horizon 2020.

In summary, despite the success in recent decades, we are now faced with both threats and opportunities.

- The core of European R&I policy has mainly been project/instruments-driven, following the strategy of "provide supply of R&I". It has led to quality improvements in research (e.g. ERC) and triggered/attracted collaboration between research and industry, but there is neither an embedding policy purpose nor a framework with regard to which the impact of R&I policy could be assessed.
- Most projects are 'successful' but there is a lack of shown impact – so far the main criterion is to successfully implement the budget. More serious impact-oriented measurement and assessment is needed.
- What is lacking is a policy/strategy programmatic vision and rationale what European R&I policy is actually for and better connection between supply-side and demand-side. With Horizon 2020 and the emphasis on Societal Challenges, a partial vision is now provided.
- Such a policy vision and strategy driving the instruments is important for reasons of legitimacy and real impact of actions taken, but also to avoid policy instruments to become just the result of 'arbitrary lobbying for partial interests'.
- The Lund-revisited conference in December 2015 will be an opportunity to take stock and to discuss the next steps forward in not only tackling societal challenges but also anticipating challenges ahead.

To reach the full impact of the present R&I supply-driven instruments, better linking R&I investments (as the supply-side) with demand-side policies (such as environment, health or the bio-economy) is needed. The linking between the 'supply' and 'demand' sides would also facilitate synergies with the Structural Funds, and it could be further fuelled by making targeted use of the Strategic Investment Fund. The linking process should also be 'located' in spaces where the actors can meet and collaborate in ways that capitalise on the opportunities offered by open science and open innovation approaches. The set of present instruments focused on individual projects needs to be expanded to a broader challenge/mission oriented approach. A revision of the present Rules of Participation would also be needed, e.g. the requirement of three legal entities from three different countries does not necessarily respond to the modern and more open ways of working in science and research. The present rules were designed in order to justify projects at European level.

3. Revisiting the demand-side instruments to allow for smart disruptive innovation reaching out to the single market: A new role for EU R&I Policy

EU R&I policy has proven successful in particular on the supply-side. This has been manifested through the long success of the mobility programme and since FP7 through the 'flagship' of ERC paving the way to future breakthroughs. We have now to complement the supply side with a demand/mission – led approach building on the experiences of the first years of Horizon 2020. There is a need to fill the gap between supply and demand. When mission-oriented supply is linked to smart demand, then there is a potential for real change (e.g. solutions to societal challenges and incentives for the uptake of disruptive innovations). The EU R&I policy must link closer to the other sectorial EU policies, defining concrete missions in the realm of a broader EU energy, transport, environment, health, taxation, foreign policies etc. In this way EU R&I will also clearer benefit the citizens.

In practical terms, the demand-led approach should build on better connecting DG RTD with other policy DGs and interaction between different policy DGs. In this way DG RTDs policy will be coupled

to strategic EU policy objectives and long-term guiding ambitions. The lead-market (LM)[4] concept was a forerunner in this context and a step in the right direction, but requires careful anticipation of market developments at global, and not only at European level.[5] In addition the European Innovation Partnerships (EIPs)[6] was also a good step in working strategically with other DGs. The main weaknesses of these initiatives are the identification process and, in the case of EIPs, the level of ambition of the approach. The key to partnerships such as the LM/EIP has to start with an identification process in partnership between DG RTD and other Policy DGs.

One key-element in interaction with and between Policy DGs is a more R&I-friendly regulation.[7] EU-legislation and regulatory framework often hamper novel ideas to get through. Social Innovation tends to flourish where there is no tight social regulation in place. Regulation can also, if well designed, foster more corporate disruptive innovation, by rewarding the firms that have invested in innovation. Innovation should be a criterion of Impact Assessment of all new and revised EU legislation.

4. Strategy to achieve the new approach

As explained above we have today mainly a supply driven R&I policy. With an 'open an transformative approach we mean an integrated strategy combining mission-oriented and disruptive innovation-friendly elements, by better linking supply of and demand for R&I.

We have a wide spectrum of policy opportunities, where this integrated strategy promises to be fruitful, e.g. energy, environment/climate, the new transport system, health and ageing, taxation, foreign policy, etc.

4.1. Partnerships for Innovation between DG RTD and other policy DGs

The time is now ripe for a new EU R&I policy which position Europe as Driver of Change in the global networked economy. However, we should not do the same 'mistake' as in the Innovation Union, setting up policy in DG RTD without a strong ownership of the demand-side DGs. Therefore, we would propose that during the autumn 2015 The Commissioner for R&I to work bilaterally with a number of Commissioners to elaborate "Partnerships for Innovation".

The outcome of each partnership could be a 'Memorandum of a joint Communication' where both parts would commit to revise their instruments for better convergence; and it is in this context the Horizon 2020 Work Programmes could be revised towards a more mission-oriented approach.

RISE is prepared to assist in this endeavour thorough specific advice and/or participating in any Working Groups which might be set up.

Preliminary suggestions of possible 'partnerships' are in annex 3.

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4 http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/index_en.htm
5 The experience of Germany's solar panel 'lead market' policy is instructive in this regard.
6 http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip
7 RISE Background paper on EU legislation in ERA and Innovation, Dan Andrée, January 2015.

4.2. From supporting projects to enabling disruptive innovation and tackling challenges

Current instruments are focused on problem solving and work well for supporting excellence (i.e. ERC/MSCA-grants and FET-projects) or specific problem solving (e.g. in parts of industrial technologies and some areas like health). These instruments, and in particular the ERC/MSCA grants, should continue to be a specific asset of European R&I policy, strengthening Europe's position in the global scientific competition. However, in order to tackle societal challenges and enable disruptive innovation, additional and complementary approaches are needed, based on the principle of integrating demand- and supply-side of R&I:

- Larger projects and/or better coordination between projects are needed, in line with the size of the societal challenges ahead and harmonised with the DGs in charge of major policy initiatives of the EC. Longer-term flagship-type projects could be useful for very large challenges where coordination is necessary, where the direction to follow is reasonably clear, and which are tightly embedded in thematic policy ambitions. There are some examples of well-coordinated project bundles we can build on, such as the 'mission-oriented' approach underpinning the PPPs for future internet. The approach is based on obliging projects to work with each other for a broader goal. At the same time, there is a sequencing of projects into three phases, where the latter is very close to market and drawing on substantive private investment, funding accelerators throughout Europe where innovative SMEs can get finance.
- To give priority to investment in research infrastructures that allow satisfying high scientific ambitions, while at the same time enabling research in line with major European policy initiatives. This kind of approach could actually provide an additional rationale for selecting projects to be funded through the European Strategic Investment Fund.
- To support "institutional excellence" in order to create "spaces" for the interaction of open science and open innovation. This could be achieved by supporting long-term co-operation between excellent European higher education and research institutions (HEIs and PROs). Strategic alliances of leading European HEIs and PROs with strong scientific credentials could be supported, in order to allow for interactions between advanced and up-stream research agendas and major challenges. Complementary to the individual (PI) based ERC grants, institutionally based excellence in Europe is key to supporting the interactions between supply and demand with an open science and open innovation approach.[8]
- Better alignment of national and European priorities/programmes requires engagement of corresponding policy-ministries at national/regional levels in the definition of major R&I initiatives. For instance, synergies between Framework Programme and the Structural Funds have to be realized at national/regional level, for instance in the context of smart specialization strategies, but could be inspired and guided by policy goals at EU-level. Research Performing Organisations could also play a more important role in coordinating efforts at European and at national levels. For instance, they could be given greater responsibility in coordinating EU-programmes and national programmes through combined support of collaborative project and coordination. Promising experiences with this kind of approach have been made in the context of the SET-plan.

4.3. Enabling change to happen

Complementary to R&I initiatives that are better embedded in demand-side policies, care needs to be taken to provide the necessary conditions for disruptive innovations and innovations for tackling societal challenges to be taken up more rapidly in economy and society. This requires strong partnerships with other EU policy areas (and DGs), where regulatory measures and other policies need to be better geared towards facilitating the widespread uptake of innovations with a disruptive and market-creating potential. It is only then that substantial private investment will be leveraged. To achieve this, a number of inroads need to be pursued:

- In areas, where the European policy level has clear political responsibilities for defining regulations and/or investments (e.g. in chemical regulation, competition policy, infrastructure investment), facilitating or hindering impact of these policies on the uptake of (disruptive) innovations and associated business models should be considered early on the process of developing these policies.

[8] "Science Ecosystem 2.0: how will change occur?",Thomas Crouzier, Low value contract, 2015

- In areas, where policy development and implementation is largely in the hands of Member States, the corresponding DGs, and hence including DG RTD, should urge Member States to provide the necessary conditions for facilitating business development and investment geared towards exploiting the potential of disruptive innovations. The impediments to innovation and new business models imposed by long-established regulations need to be carefully scrutinized.

5. Summary and possible actions

A re-orientation is suggested towards a 'open and transformative R&I policy' that relies on a better coordination between supply and demand in order to enhance the impact of R&I on purposes and goals of European policy:

- We need to move from a 'project – instrument driven supply policy' approach to a more 'challenge driven mission/demand policy' approach while ensuring interaction between them.
- This approach must take into account financial instruments such as the Framework Programme, Structural Funds, EFSI as well as the wider Innovation ERA.
- We have to move beyond the present rigid system of collaboration and take advantage of Open Science as a new way of collaboration across borders in Europe and at a global scale.
- While taking into account the importance of protecting citizen interests, regulations should be scrutinized with regard to their hampering role for disruptive innovation and associated business models
- There is an excellent opportunity the coming years to take a step in this shift of policies – 'DG RTD goes outside its cocoon' for the benefit of the citizens.

RISE proposes a step-wise approach for new role of EU R&I Policy/funding:

- Elaborate a new EU R&I policy framework, outlining the purpose and the expected qualitative and quantitative impacts of EU's investments in R&I. Suitable measurement and assessment methodologies need to be developed for that purpose.
- Establish strategic 'Partnerships' with policy DGs in order to define a two-pronged approach of (i) better embedding 'supply-side' R&I policy in other EU policies, and (ii) better gear EU policies in different domains towards facilitating (disruptive) innovation to spread and make effective use of R&I for addressing societal challenges.
- Maintain the orientation towards fostering scientific excellence and mobility as an element in the RTI policy portfolio as well as supporting research infrastructures and 'institutional excellence' for higher education consortia, in order to further strengthen the global positioning of European research and ensure a continuous flow of novel ideas to emerge.
- Realising the 'open and transformative approach to R&I policy' requires addressing two sides of a coin ('package deal'), namely (i) to revise the thematic agendas and the portfolio of R&I policy instruments in order to gear them better to the purposes and goals pursued by other policy DGs, and (ii) to ensure that other policy DGs take into account the need for fostering disruptive innovations in their respective policies, including those implemented in cooperation with Member Stages.
- In operational terms, there are several opportunities ahead for triggering the shift towards the new approach:
  - Initiation of pilots (open science, free zones to test mission-oriented approaches etc.) in the last years of H2020 – WP 2018/19 and WP2020.
  - The Mid-term review of H2020 in 2016/17 should be forward looking drawing on experiences from last years of FP7 and the start of Horizon 2020.
  - The preparation and planning of 'Horizon II' should start at the end of 2016 in order to arrive to a full-fledged proposal by mid-2018.

RISE is prepared to assist the Commissioner through specific advice and/or participating in any Working Group which might be set up.

Annex 1: Some arguments for a change[9]:

- Europe's productivity gap with respect to e.g. the United States is not just, or not so much, due to our lower R&D intensity, but also to our poorer 'factor reallocation's (rigidity in the labor market and resistance of moving to new technologies, in particular digital technologies).
- There are other dimensions worth pursuing benefiting the citizens even if they do not immediately produce more growth: environmental protection, better health, more justice, a more equitable (not necessarily equal) distribution of income.
- Regarding innovation policy, there is room for improvement in thinking globally, at least at the European level, instead of competing with nationally oriented policies, e.g. Member States competing using R&D tax incentives to attract business in their own state. There are evidences10 that tax-credits are a zero-sum game where research and innovation activities just are moved between neighboring countries.
- Innovators, entrepreneurs should be able to profit from their innovations but at the same time, they should not be protected from competition of new technologies.
- The traditional economic approach to analysing the impact of EU R&I policies on growth, as reflected in the Europe 2020 strategy, is today too narrowly focused on the existing metrics of "old" growth ignoring the wider impact of research on broader societal aspects, such as improved knowledge understanding, wellbeing, signalling of societal problems, access as opposed to possession of goods/services, etc.

9 Jonathan Haskel and Pierre Mohnen

10 Is international R&D tax competition a zero-sum game? Evidence from the EU, Carol Corradoy, Jonathan Haskel, Cecilia Jona-Lasinio, Bilal Nasim, March 2015

Annex 2: History of priority setting in the Framework Programme

Extract from: Priority-setting in the European Research Framework Programmes, Dan Andrée, 2009, http://www.vinnova.se/upload/EPiStorePDF/va-09-17.pdf

1. Criteria for community involvement in research

The criteria for FP1 are more or less valid also today:

Community involvement is justified by:

- Research conducted on so vast a scale that single Member States either could not provide the necessary financial means and personnel, or could only do so with difficulty;
- research which would obviously benefit financially from being carried out jointly, after taking account of the additional costs inherent in all actions involving international co-operation;
- research which, owing to the complementary nature of work carried out at national level in a given sector, would achieve significant results in the whole of the Community for problems to which solutions call for research conducted on a vast scale, particularly in a geographic sense;
- research which contributes to the cohesion of the common market, and which promotes the unification of European science, and technology; as well as research which leads where necessary to the establishment of uniform laws and standard.

The most significant change with regard to Criteria/Objectives came via the Maastricht Treaty where it was stated that the FP should also promote 'all the research activities deemed necessary by virtue of other Chapters of this Treaty'. This is an important addition as it means that research activities are implicitly included when new areas are added to the Treaty.

2. Summary of Characteristics of the FPs

FP1: 1984-1987, (EUR11 937 million/year)

Policy areas, transnational cooperation, industrial, pre-competitive, pre-normative, ICT, Materials/Energy

FP2: 1987 – 1991 (EUR 1.35 billion/year)

Single Act, quality of life and mobility added

FP3: 1990 – 1994 (EUR 1.425 billion/year)

Themes

FP4: 1994 – 1998 (EUR 3.304 billion/year)

Maastricht Treaty, Four activities, Transport, social sciences

FP5: 1998 – 2002 (EUR 3.74 billion/year)

Key Actions, socio-economic research, societal problems (ageing population)

[11] EUR is used throughout this paper although before 1st January the ECU (European Currency Unit) was used.

FP6: 2003 – 2006 (EUR 4.375/year)

New FP, European Research Area, coordination, integrating projects, network of excellence, support to policies, new and emerging technologies, ethical issues

FP7: 2007 – 2013 (EUR 7.767 billion/year12)

Seven years, aligned for the first time with the Financial Perspectives with budget discussions on the highest political level, Lisbon, Frontier Research, Public Private Partnership, Research Infrastructure, Regions, RSFF

FP8: 2014 – 2020 (EUR 10 billion/year +?)

Cooperative Research (Joint Programming, JTIs, Societal Challenge, Private Public Partnership, 'Pre-commercial Procurement), ERC, Research Infrastructure, Mobility, EIT?

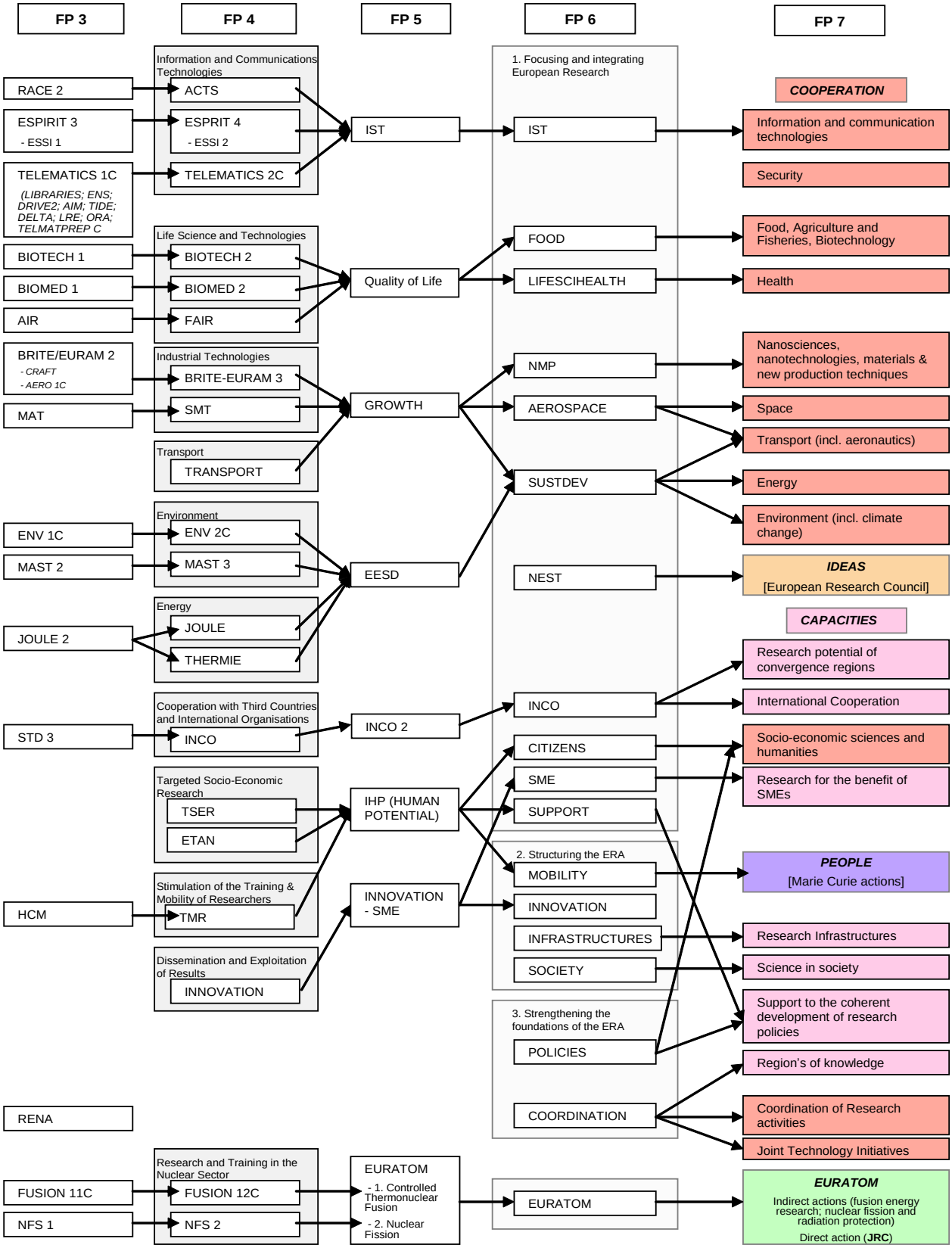
3. Instruments of Framework Programmes

Evolution of the Framework Programme					
FP1 – FP5	Project level	Mobility SME-actions RIS			
FP6	+	+	Programme level : ERA Coordination		
FP7	+	+	+	ERC	
Horizon 2020	+	+	+	+	Challenge Driven: Societal challenges
Horizon II	Supply side: ERC/Mobility/RIS Individual projects	Mission driven connecting supply and demand side in interaction with policy DGs with innovation friendly legislation			
	New ways of collaborating with open science/innovation in a global world				

[12] Note that the budget for 2010 was over EUR 10 billion.

4. Thematic evolution of framework programes

Source: Table from the FP6 evaluation, Report of the Expert Group, February 2009.



The table above (from the evaluation of the FP6[13]) shows how priorities have developed from FP3 to FP7. The first observation is that the structure has mainly been 'thematically' oriented with one exception in FP5 where the structure reflected more the political priorities (e.g. quality of life) complemented with problem-solving 'key actions'. Another reason for the change in FP5 was the general feeling that FP4 with its 16 different thematic areas was becoming difficult to manage. However, even though the number of areas was reduced in FP5, in practice it did not significantly change the implementation as the areas were divided into different configurations. One conclusion is that there was a large degree of continuity in the thematic structure even if the actual content, especially on 'topic level' (specified in the Specific Programmes and in the annual Work Programmes) has changed significantly.

One interesting aspect pointed out in the paper, FTA (Future-oriented Technology Analysis) for Research and Innovation Policy and Strategy[14] is the 'extreme reluctance of panels to identify negative priorities or "posteriorities" from which resources may be transferred to positive priorities'. In the Framework Programme this problem has so far been 'solved' with an increasing budget. The best example may be the IT area which had around a 40% share of the budget in FP2 but 'only' around 20% in FP7. However, the budget increased from EUR 2.275 billion in FP2 to EUR 9.05 billion in FP5 - an increase of 400%. It is actually hard to find any areas which have been 'de-prioritised' in the history of the FP, except fusion/fission which was drastically reduced from FP1 to FP2.

5. *Evolution of the Framework Programme illustrated by FP7*

Level	Evolution of the Framework Programme	COOPERATION Strengthening Collaborative Research	IDEAS Strengthening Scientific Excellence	PEOPLE Human resources	CAPACITIES	Supporting and coordinating Polices
Policy Level[15]	FP7 and partly FP6	Article 169, Joint Programming	'Independent ERC'	Legislation (Human resources)	ESFRI, Regional Authorities, International Agreements, SFIC	OMC, Coordination of policies, 3% (benchmarking), legal measures
Programme Level[16]	FP6, FP7	JTI through art 171, ERA-NET, ERA-NET +, Article 169		Co-funding of national programmes	SME Exploratory Awards, Article 169	[ERA-NET, ERA NET +, Article 169]
Project Level[17]	FP1 – FP7	Collaborative projects, Networks of Excellence	European Research Council (grants to teams)	Grants to mobility	SME actions	

[13] FP6 evaluation, Report of the Expert group, February 2009.

[14] Luke Georghiou Jennifer Cassingena Harper, http://forera.jrc.ec.europa.eu/fta_2008/anchor_paper_3.pdf.

[15] Ministries on national and/or regional level depending on the structure of the relevant MS.

[16] Funding agencies, research councils, ministries and stakeholders (in the case of JTIs) depending on the structure of the relevant MS.

[17] Research performers (industry, academia, users etc.)

1. Scenarios for 'thematic structure' of FP8 – 'cooperative part of FP8'

Options		Advantages	Disadvantages	Implementation
Themes	Health, ICT, Environment, Energy etc.	Continuity, proved to work, flexible, fits COM structure	Difficult to deprioritise, non-political, cross-cutting issues difficult	COM/Executive Agency, Cooperative projects
Grand Challenges	Zero-waste society, Quality of life	address political priorities, focused, European added value	How to agree? Does not fit into COM structure, how to address key technologies?	COM/Executive Agency, JP, Article 169, ERANETs
Competitiveness-driven research	New Medicine, Manufacturing technologies	addresses the main aim of the FP,	How to agree? Does not fit into COM structure, how to avoid covering all sectors?	JTIs, PPPs
Policy-driven research	public health, food quality	address political priorities,	How to avoid 'shopping-list'	COM/Executive Agency, cooperative projects
Key technologies	Bio-technology, nano-technology, parts of ICT	enabling technologies needed for most applications	difficult to address political priorities	COM/Executive Agency, cooperative projects

Ultimately, the different options could be seen as building blocks with Grand Challenges as the major novelty in FP8 complemented by competitiveness and policy-driven research. In addition, curiosity-driven research would be supported within the ERC. The final piece in the jigsaw would be 'targeted curiosity-driven research' in the form of support for 'emerging needs'. Two other important 'bottom-up' activities are foreseen in actions to support transnational mobility and actions to support capacities in Europe, especially through research infrastructures and ensuring all MSs are fully involved in the FP.

A structure taking into account all the above building blocks should enable FP8 to play an even more important role when it comes to acting as a facilitator to initiate and fund activities such as Joint Programming, JTIs, and Research Infrastructures etc. This should also entail a more flexible approach to funding levels ranging from, say, 10% up to 75% in some special cases (SMEs).

Annex 3: Preliminary suggestions of possible 'partnerships'

Title of partnership	Commissioners involved	Key elements of partnership
Framework conditions coupling disruptive innovation with innovative markets	Vice-President Katainen, Vice-President Timmermans, and Commissioner Bienkowska and Crețu	• Regulations for innovation, innovative public procurement and public sector innovation, eco-system and entrepreneurship, smart demand ('from lead markets out to the full innovative single market'), etc.
Disruptive solutions for the Energy Union	Commissioner Arias Cañete	• Elaborate strategic long-term goals for a new energy system in Europe based on renewable energy. • Revise regulations, invest in infrastructure and stimulate innovative markets in Europe for current disruptive innovation.
Future of traffic system in Europe	Commissioner Bulc.	• Elaborate strategic long-term goals for Clean and Safe driverless vehicles to lower the death toll on roads in Europe, decrease traffic congestions, eliminate air pollution (Co2 and noise), independence from oil import, etc. • Revise regulations, invest in infrastructure and stimulate innovative markets in Europe for current disruptive innovation in the car sector, the new generation of electric, driver-less cars, which are already being tested in the USA
Addressing Climate change	Commissioner Vella.	• In line with Paris summit on Climate change, elaborate long-term goals for the Sharing economy, Circular economy • Revise regulations, invest in infrastructure and stimulate innovative markets in Europe for current disruptive innovation in clean-tech innovations for the green economy
Reindustrialisation and Industry 4.0	Commissioners Oettinger and Bieńkowska	• Revise regulations, invest in infrastructure and stimulate innovative markets in Europe for current disruptive innovation in the manufacturing sector in Europe, PPPs for future internet etc.
The disruptive role of creative industries	Commissioner Navracsics	• Strengthen the role of creative industries with its high growth rate and resistance to the crisis.
An ageing Europe	Commissioner Andriukaitis	• Elaborate strategic long-term goals for the 'silver economy', and an active and healthy ageing • Revise regulations to involve +65 generation more actively and flexible in the economy and society taking advantages of their specific interests, value added and experience, invest in infrastructure and stimulate innovative markets in Europe for the 'silver economy'.

Creating new jobs in Europe	Commissioner Thyssen Commissioner Crețu	• Framework conditions for getting more jobs in Europe from Horizon 2020 and Smart specialisation – inclusive innovation. • Elaborate strategic long-term goals for Social innovation • Revise labour market regulations, skills and training, mobility of labour. • Pro-active approach to synergies between Horizon 2020 and the Structural Funds.
Fostering a mobile and innovative workforce	Commissioner Navracsics	• Broaden the scope of MSC grants to include other domains than research
Optimal fiscal policies for research and innovation at EU level	Commissioner Moscovici	• Value of research and avoiding harmful (0-sum game) competition on tax incentives (DG TAXUD and DG ECFIN).
Science diplomacy	Vice-Presidence Mogherini and Commissioner Malmström	• Science Diplomacy - collaboration between scientists, university professors and higher education students between the EU and 'strategic geographical areas' to support policy goals, e.g. North Africa for immigration, Muslim world for human rights/governance, etc.

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The EU invests substantially into the supply side of R&I, in particular through Horizon 2020 and Structural Funds, but what is missing is an explicit long-term strategy guiding these instruments. As a consequence, impacts remain unclear and disconnected from broader policy objectives.

Instead of this instruments-centred approach to R&I policy, RISE suggest to go for an open and transformative R&I policy, based on an approach that is on the one hand tightly connected to political ambitions of the EU, and on the other hand sensitive and open to ongoing changes in the economy, in particular new forms of disruptive innovations and associated new business models.

In other words, the supply side of R&I policy needs to be more mission-oriented, further enhancing the ambitions of Horizon 2020, while the demand-side of needs to be smarter and allow disruptive innovations to reach out to the single market.

To achieve this, three complementary inroads are suggested. First of all, partnership for innovation should be concluded between DG RTD and other policy DGs, in order to better link and coordinate the supply of and the demand for R&I. Secondly, R&I funding should move from supporting individual projects to tackling major challenges and enabling disruptive innovation. This will require on the one hand larger-scale, sustained and coherent R&I investments in coherent mission-oriented project bundles at both European and national levels, and on the other hand the creation of institutional spaces where open science and open innovation can meet and interact. Thirdly, with a view to enabling change to happen, policies and regulations at European and national level should be scrutinized with regard to their facilitating or hindering impact on disruptive innovations.

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