

Fostering Impact and Sustainable Collaboration in FP9 within a new Common Research, Technology and Innovation Policy

By the Austrian FP9 Think Tank

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Contents

- Think Tank Members in Alphabetical Order 4**
- Executive Summary..... 5**
- Introduction 12**
- 1. Establishing the Rationale for a (new) European RTI Policy..... 14**
 - 1.1. Starting Position..... 14
 - 1.2. Main Objectives of a new FP 15
 - 1.3. Fundamental Requirements and Principles for the Design of FP .. 15
 - 1.4. General Approach and Measures to Arrive at a new FP 18
- 2. Architecture and Governance 20**
 - 2.1. Starting Position..... 20
 - 2.2. Focus of this Section..... 20
 - 2.3. Fundamental Requirements and Principles 21
 - 2.4. General Approach..... 22
 - 2.5. Specific Approaches and Measures..... 23
- 3. Fostering Positive Impacts..... 33**
 - 3.1. Starting Position..... 33
 - 3.2. Focus of this Section..... 33
 - 3.3. Fundamental Requirements and Principles 33
 - 3.4. General Approach..... 35
 - 3.5. Specific Approaches and Measures..... 35
- 4. A Strategic Approach and Adequate Instruments for Sustainable Collaboration with Third Countries 43**
 - 4.1. Starting Position..... 43
 - 4.2. Focus of this Section..... 43
 - 4.3. Fundamental Requirements and Principles 43
 - 4.4. General Approach..... 45
 - 4.5. Specific Approaches and Measures..... 46
- Glossary 51**

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Executive Summary

The EU is facing a challenging situation where the legitimization of a European policy is being questioned in many areas, and national(istic) approaches are being put forward as alternatives. At the same time, global challenges are growing: from climate change and social inequalities, to ensuring sustainable development and inclusive growth while coping with new technological revolutions and increased competition. Against this background, a renewed emphasis towards new and newly arising challenges and opportunities for Europe is needed. This has to be complemented by an adapted justification for European RTI policies as well as strong rationales for Europe. This applies also to the EU Framework Programme (EU FP) – the largest research technology and innovation (RTI) programme in the world – which has become a major determinant of RTI policy for many European countries and of the European Research Area. Although several elements of the EU FPs have become unique success stories, the design of the current FP Horizon 2020 relies to a significant extent on rationales, structures and procedures inherited from earlier generations of European FPs. Its governance, funding and incentive structures, while having quite some positive impact overall, do not realise its full potential and do not contribute enough to addressing the global challenges. A bold orientation towards the new global developments and new framework conditions requires rethinking of the policy context, governance structures and instruments. Thus making sure, that Europe will be set up to take a pro-active approach as real global player based on research and innovation.

Fundamental requirements and principles

To have a much greater impact in the future with respect to the challenges mentioned, **a truly 'Common Research, Technology and Innovation Policy (CoRTIP)' is needed.** The purpose of CoRTIP is to put the structures and mechanisms of RTI policy at European and national levels as effectively and efficiently as possible to work, by serving as a common framework to align EU and national policies and enhance synergies and complementarity. Such a CoRTIP would extend well beyond the FP, but the

FP is an important part of it. Essential principles of such a common policy should be:

- **a clearer focus on genuinely European themes** which would imply a stronger selectivity in terms of what is addressed in FP9;
- **a much better alignment of European and national RTI policies**, which demands the development of new mechanisms for priority setting, work programme definition and (co)funding and/or the substantial improvement of existing mechanisms;
- **a continued and increased emphasis on contributing to solving ‘grand societal challenges’**. Here, the aim should be **to take the global pole position in addressing societal challenges** in line with the 2030 Agenda for Sustainable Development. To this end, we need to **arrive at real European and better-articulated ‘mission-oriented policies’** with clearly-defined goals in policy areas such as health, environment, climate change, food safety and security, social cohesion and European identity, mobility, energy and security;
- **a strengthening of the interfaces between the three pillars**. While supporting an overall architecture of the next FP along the lines of the three pillars of Horizon 2020, we underline the necessity of improving the interaction and exchange between these pillars;
- **participatory elements and an inclusive approach** (at least in areas where societal issues are addressed) are vital. Involving end-users, citizens and a broad variety of other actors can boost innovativeness, speed up dissemination processes and help to develop new business models and social innovations.

While we would like to see the FP having much more impact in terms of relevant innovation and contribution to addressing societal challenges, we would at the same time like to see **the profile of FP9 sharpened and ensured that it is a programme focussed on R&I**. The greater impact on innovation and societal challenges should not come from incorporating more and more instruments of RTI policy into the FP, in particular when these instruments are very close to the market and resort to general economic policy at the level of member states. Rather; we would seek an enhanced

impact via better orchestration with other instruments and with other policy areas, and greater coherence in the use of different policy instruments including those outside the FP (e.g. by ESIF, EIB, EUREKA...).

We would like to see the recognition that innovation is more than technology established as a principle in past Framework Programmes. Innovation includes various kinds of non-technical innovation (e.g. business model innovation, social innovation, policy innovations, and transformative systems innovations) as well as the recognition of social sciences and humanities (SSH) and arts-based research as an integral part of this understanding of RTI. Also, the principles of responsible research and innovation (RRI) should be fully recognised as a guiding orientation for all pillars of FP9.

Finally, **international cooperation should be firmly anchored, empowered and exercised at the European level** to drive the European RTI internationalisation agenda forward. The EU Member States should be involved in this process and embed their national cooperation interests in the wider European internationalisation agenda. International opening up and cooperation in RTI, however, should be based on strategic guidelines that reflect the ambiguous nature of international RTI: it has advantages but can also result in strategic and first-mover knowledge being leaked. Thus, issues concerning intellectual property rights must be considered from the onset.

Actions to be taken

In order to achieve these goals and to fulfil these fundamental requirements, a number of actions have to be taken:

- Budgets are strategies expressed in figures. Consequently and given the challenges described above, **we strongly recommend a substantial increase of the budget of FP9 in the order of €130 bn** despite a reduced number of member states and tight (national) budgets. This demand is nevertheless justified by the challenges of increased competition from other regions of the world, the societal challenges like climate change, security and others, and the new type of mission-oriented poli-

cy we advocate all ask for such a substantial change towards a stronger European RTI policy and agenda. An adequate budget size will also ensure that the top research teams and companies will stay involved in the programme and the best proposals can be funded with a reasonable success rate. In addition, a substantial increase of the FP budget will also serve as leverage to increase national efforts.

- In order to implement a CoRTIP between the different parts of the FP, different RTI related policy areas and between the MS and the EC:
 - **a central role must be given to ERAC as strategic coordinating body among member states and the EC**, where the respective priorities of R&I policy and funding are harmonised. For ERAC to fulfil such a strengthened strategic role, it will be essential that member states endow ERAC members with the necessary competencies;
 - **JPIs shall be given more prominence as an instrument** than today, in order to address major RTI challenges in Europe more effectively and flexibly. In particular, they should play a more strategic role in areas where the FPs cannot claim to be the most suitable approach. A growing prominence of JPIs ultimately suggests a common RTI policy, but with **variable speeds and variable geometries**;
 - **a strategic programme management needs to be established at the level of individual programmes** that oversees the entire process from programme design to exploitation of findings. Ultimately, this is to ensure that the EU FP delivers more impact than just the sum of individual projects;
 - to bridge the activities of the 'three pillars', a significant share of **funding volume in KETs and societal challenges should be devoted to basic research and for research to understand and anticipate future challenges**, complementary to the more general ambition of realising solutions-oriented research;
 - to better link the FP with the Structural Funds (SF), it is suggested that **targeted R&I projects and initiatives should be addressed by FP, whereas the advancement and consolidation**

of R&I infrastructures should be placed within the frame of Structural Funds. Around 50% of funding from the SF should be reserved for RTI, underpinned by harmonised procedures between the two actions. Similar provisions should be foreseen in other major areas of EU policy in order to make innovation a genuinely European ambition.

- To increase the efficiency and effectiveness of the FP, an improvement (sometimes a major one) of some of its instruments is needed. In this vein:
 - We suggest to - after **critically reviewing** the results of existing and up-coming **evaluation results of EIT** – try to preserve essential and successful elements, while leaving all options open for future developments;
 - We recommend to **design the European Innovation Council (EIC) in the role of a ‘Strategic Intelligence Hub’ for advising a comprehensive innovation agenda in support of CoRTIP**, covering e.g. the tasks of monitoring innovation orientation in ERA, informing key bodies in charge of innovation policy (ERAC, strategic programme management teams, the European Parliament, the European Council) and playing the role of a strategic knowledge interface between R&I policy and sectoral policy DGs;
 - We suggest the **efficient integration of thematic networks** such as COST Actions **as an instrument within the first pillar of FP9** as they represent an important element for nurturing the research landscape by supporting the formation of thematic research networks in emerging areas of science and research;
 - We recommend the development of **‘impact strategies’** to foster exchange, synthesis and joint exploitation of project groups. Better **impact monitoring** on the basis of all the three programme pillars should be developed and implemented that goes beyond measuring activities, publications and collaboration patterns, but rather fosters impact orientation and also takes into consideration and

mitigates potentially negative impacts (societal impact assessment);

- **The European Research Council (ERC) is a unique success story** in promoting excellent frontier-research, in leveraging different research strengths through its competitive funding and in attracting and retaining outstanding researchers. However, there are **certain shortcomings** that **should be addressed in FP9** to ensure better usage of frontier-research results through fostering linkages with other pillars and areas and in the support of collaborative frontier-research;
- By enabling collaborative frontier-research, the FET programme represents an important complement to investigator-driven research, but has been largely focused to ICT-related research. It is therefore recommended to **ensure that the FET programme fully serves all areas of research and innovation**, and is endowed with appropriate resources;
- We consider **PPPs and cPPPs** to be effective instruments in supporting innovation along a well-defined and needs-oriented intervention logic. However, their **transparency and accessibility need to be ensured**;
- **P2Ps and ERA-Net instruments should be continued** as they are important instruments in jointly setting priorities, achieving a critical mass, ensuring strategic orientation and involving important actors on EU and member state level. **Longer-term instruments (e.g. repeated joint calls) are needed** in addition to one-time instruments.

With respect to RTI **internationalisation**, the EU as a main global player must be in the position to act globally and put more emphasis on international RTI cooperation in the future with a smart mix of open and targeted elements. These include:

- existing approaches towards internationalisation should be complemented by a **specific 'RTI for development' initiative**;

- in every RTI call, which is strategically 'cleared' and suitable for RTI internationalisation, each R&I project selected for funding should be able to apply for and use in a bottom-up way **5% to 15% of its overall budget as a contingency reserve for international RTI cooperation activities**;
- EUREKA Globalstars should be supported via Art. 185 co-financing, provided that the bureaucratic efforts are simplified. **EUREKA Globalstars should act as flexible applied RTI cooperation instrument** to allow different single joint applied R&D calls with third countries.

Introduction

The EU RTD Framework Programmes and the establishment of the European Research Area are of great importance for Austria. In order to contribute actively to the discussion and design of the next Framework Programme, the Austrian FP9 Think Tank was established by the Federal Ministry of Science, Research and Economy in May 2016 to develop ideas and proposals for a future European Research, Technology and Innovation (RTI) policy and a more effective and efficient Framework Programme. As an outcome of the intensive discussion within the Austrian FP9 Think Tank, its members published a theses paper¹ with 10 theses in October 2016.

This paper served as an input for further discussion with Austrian stakeholders, a process also initiated and governed by the Ministry of Science, Research and Economy. The theses paper was presented and discussed at a stakeholder conference² on 10th of October, followed by an online stakeholder consultation. The position papers of the participating organisations and persons were summarised in a synthesis report³.

In addressing various ideas resulting from this stakeholder process and in further developing and deepening specific aspects of the theses paper, the Austrian FP9 Think Tank decided to continue its activities, starting its second phase in November 2016. This second theses paper at hand is the result of this discussion.

As with the first theses paper (Oct. 2016), the members of the Think Tank do not represent the organisation they work for but are acting in a personal capacity. They have joint authorship of the second theses paper (March

¹ Austrian FP9 Think Tank (Oct 2016), 'Theses Paper for Shaping the Next Future (9th) EU-RTD Framework Programme'

, <https://www.era.gv.at/object/document/2826>

² Stakeholder event "Das 9. EU-Forschungsrahmenprogramm 2021–" (10 Oct 2016), for agenda and presentations see https://www.ffg.at/europa/veranstaltungen/stakeholder-fp9_2016-10-10

³ Synthesis Report of the Stakeholder Consultation for the upcoming (9.) EU-FP <https://era.gv.at/object/document/3036>

2017). Its opinion does not constitute a position of the Austrian government, even though the process is governed by the Federal Ministry of Science, Research and Economy. All representatives of the ministries responsible for R&I have been accompanying the process. Again, the ministry thanks the members of the Austrian FP9 Think Tank for contributing their time and expertise for this second phase and for further fertilising the discussion process at the Austrian and European levels.

1. Establishing the Rationale for a (new) European RTI Policy

1.1. Starting Position

The EU FP has grown to become the largest RTI programme in the world in recent decades. It can be considered one of the cornerstones of the European integration project. It has become a major determinant of RTI policy for many European countries and a major source of competitive RTI funding for all types of RTI organisations in the EU. The EU Framework Programme is also a major determinant of the European Research Area, providing glue money for the necessary joint funding.

Currently, the EU is facing a challenging situation where the legitimization of a European policy is being questioned in many areas, and national(istic) approaches are being put forward as alternatives. Against this background, a renewed emphasis towards new and newly arising challenges and opportunities for Europe is needed. This has to be complemented by an adapted justifications for European RTI policies that provide substantial European added value.

The way Horizon 2020 is currently designed relies to a significant extent on rationales, structures and procedures inherited from earlier generations of European Framework Programmes, even if several amendments have been introduced since the turn of the millennium. However, with the growing importance of global collaboration in science, rising expectations with regard to the impact and benefits of research and innovation for society, their opening up to new types of actors, and the diversification of funding instruments at European and multilateral levels, a serious rethinking of the fundamentals underpinning the Framework Programme is needed.

Horizon 2020 has put a strong emphasis on the exploitation of research results, sometimes up to the point of over-burdening and diluting what a R&I programme can deliver. Moreover, the impetus towards consolidating a truly European Research Area has lost momentum and left in place a multitude

of overlapping and sometimes poorly harmonised programmes. At the same time, the nature and the requirements with regard to R&I have been changing and need to be properly reflected in FP9.

What is needed is a new and bold guiding rationale for the European Framework Programme in the global context, which, we suggest, should be based along the following main lines:

1.2. Main Objectives of a new FP

- Establish Europe as a strong and competitive region of the world;
- Provide (and make visible) convincing evidence for the necessity and the positive effects of a European RTI policy;
- Reinvigorate the European Research Area;
- Within the framework of ERA, strengthen the profile of FP9 as a research and innovation programme;
- Improve the exploitation and valorisation of R&I results;
- Make FP9 more effective, socially responsible and open;
- Ensure that the next Framework Programme reflects better the changing social and economic needs of Europe, and addresses them more effectively and efficiently.

1.3. Fundamental Requirements and Principles for the Design of the FP

To arrive at these goals, the new FP must be part of **a truly 'Common Research, Technology and Innovation Policy (CoRTIP)'**. Such a policy is needed in order to address the challenges mentioned above. The purpose of this common RTI policy is to put the structures and mechanisms of RTI policy at European and national levels as effectively and efficiently as possible to work, by serving as a common framework to align EU and national policies and enhance synergies and complementarity. Such a CoRTIP would extend well beyond the FP, but the FP is an important part of it. The implications of such a CoRTIP for governance and instruments are elaborated in

the later chapters of this paper. Here, the essential principles that such a common policy should follow are listed:

- **Clearer focus on genuinely European themes:** Complementarity with national and multilateral initiatives, as called for by this paper, would imply a stronger selectivity in terms of what is addressed in FP9. European added value (EAV) must be better elaborated, evaluated and communicated in clearly identified areas of limited number. While recognising that it will manifest itself differently depending on the RTI area, topic and mission theme, EAV could nonetheless be demonstrated if challenges on international/global level could be better addressed jointly, if coordination of national RTI policies increased effectiveness and efficiency, if diffusion of knowledge and technologies were more rapid, efforts were bundled in order to achieve critical masses, the risks of RTI were reduced substantially and competition were fostered.
- **Much better alignment of European and national RTI policies.** Today, in countries with well-developed national RTI systems, only a small part of RTI policy is explicitly and consciously linked to EU RTI policies. To achieve greater coherence between the EU and the national RTI policies, new mechanisms for priority setting, work programme definition and (co)funding must be developed and/or existing mechanisms substantially improved.
- **Continue and increase the emphasis on contributing to solving 'grand societal challenges'. Develop respective policies into real 'mission-oriented policies':** EU RTI policy should not stop at fostering and incentivising bottom-up defined research projects in broadly-defined topical areas in these challenges. Rather, the aim should be to arrive at real European 'mission-oriented policies' with clearly defined goals (defined or articulated from other EU policy areas like environment, health, social cohesion and European identity, mobility, security, ...) covering a wide range of policy instruments if necessary. **For this purpose, EU RTI policy must be much better coordinated with these policy areas.**

- **Sharpen the profile and make sure that FP9 is a R&I programme:** While emphasising the need for the FP to be 'embedded' into large and coherent policies on the European level, there are limits to what a R&I programme can deliver, and where other policy action need to take over when it comes to moving from research and innovation outputs and outcomes to the development of concrete market-based solutions. It is not the purpose of a publicly funded R&I programme to directly fund up-take and diffusion of technologies, even if the R&I that is being funded is nevertheless well-gearred towards demand-side needs and requirements. At the same time, we recognise the potentially positive effects of instruments that provide venture funding on the European level, which could be provided via channels outside the FP.
- **Recognise that innovation is more than technology:** The Framework Programmes have traditionally been characterised by a strong orientation towards science and technology. In view of today's requirements, more than science and technology is needed, and R&I activities funded within the next FP should make an effort to seriously incorporate the social, organisational and institutional dimensions of innovation. Such a broad understanding ought to include various kinds of non-technical innovation (e.g. business model innovation, social innovation, policy innovations, and transformative systems innovations). Without such a broad approach to innovation, there is the imminent risk of scientific and technical breakthroughs not being translated into innovations that yield the greatest benefits to society at large. Social sciences and humanities as well as arts-based research must be seen as an integral part of this understanding of RTI. A genuinely 'European' SSH research strand, dealing with Europe (among others) as ideological concept, as societal reality, as identity and as political structure. Europe needs a 'self-reflexive' SSH capacity of this kind in order to cope with the complex societal transformation processes it is currently undergoing.

1.4. General Approach and Measures to Arrive at a new FP

- The European Research Area represents the overarching frame into which FP9 as well as the R&I-related elements of the European Regional Development Fund (ERDF) should be embedded next to national and multilateral R&I initiatives. This will give much more flexibility for configuring R&I policy in ERA in line with national priorities. Ultimately, this suggests **an ERA of variable speeds and variable geometries ('à la carte')**. In orientating towards ERA objectives and the CoRTIP, a much closer entanglement of the next FP with the next Structural Funds period is required.
- As part of the ERA, **FP9 needs to have clear profile and value added as compared to other R&I funding initiatives in Europe**. Moreover, such a clear profile requires not overburdening FP9 with roles and instruments that are incompatible with the characteristics of a R&I programme. This implies being more selective in what the FP shall address, and what should be left to other, complementary policies and initiatives. Instruments should be reduced in numbers (fewer than now; especially the large number of public-private and public-public-partnership instruments needs to be reduced and the overlap between them limited), and differentiated along the large intervention areas of the next FP.
- While European policy must have all necessary policy tools available to achieve its targets, this does not mean that all these instruments have to be part of the FP (or of European RTI policy for that matter). This concerns e.g. instruments addressing education or enterprise finance.
- While ensuring high quality of the projects and activities carried out in the FP, an exclusive emphasis on scientific excellence as the guiding principle for the FPs must be avoided. Research excellence in conjunction with European and/or global social and economic

significance should be the guiding criteria for prioritisation within FP9.

- Much more focussing of efforts (reduction to limited number of targets and areas) to attain 'critical masses' is needed. Recent experiences point in the direction that these critical masses are only rarely achieved for the individual actors / activities.
- To increase effect, visibility, legitimacy and inclusion, the FPs should aim at broad and active stakeholder involvement. Criteria and settings for stakeholder involvement should be developed to ensure transparent, credible, inclusive participation in RTI processes. Also, the efficiency and impact of mission-oriented RTI policy would be increased if stakeholders were involved from the beginning.
- In order to strengthen its role and recognition as a major force in enhancing Europe's economic and societal welfare, FP9 needs to make a major leap forward in being responsive to society's expectations with regard to R&I. This calls for a more socially responsible approach to R&I, for more transparency and openness in the way R&I is funded and conducted, and for higher effectiveness and efficiency in implementation.

2. Architecture and Governance

2.1. Starting Position

The three-pillar structure of Horizon 2020 structures features that the Think Tank believes should be maintained in FP9. The boundaries between these pillars are, however, not as tightly defined as the structure may suggest. The results of frontier-research need to be brought to bear more quickly on research on key enabling technologies or societal challenges. And despite maintaining clearly distinct logics in each of the pillars, key enabling technologies can play an important role in research and innovation for tackling societal challenges.

A need for better harmonisation also exists between Framework Programme on the one hand, and national or multilateral programmes on the other hand, but also at the intersection with other policy instruments like Structural Funds.

These issues require revisiting governance structures and processes for managing the interfaces between different policy fields and levels, but also those for managing the interfaces between different specific instruments and initiatives within FPs.

2.2. Focus of this Section

Against this backdrop, this section develops suggestions regarding

- The repositioning of the next Framework Programme in the context of other national and European policies;
- The need for adjustment of the main building blocks of the next FP and the relationships between them;
- The governance structures and processes that need to be open and flexible enough to accommodate effective coordination.

2.3. Fundamental Requirements and Principles

- **Ensure complementarity between Framework Programme, national and multilateral initiatives:** In the context of a future CoRTIP, and building on the progress made towards realising a European Research Area, FP9 should not be yet another funding programme for R&I, but the R&I funding programmes in Europe – national, multilateral and European – should be complementary to and harmonised with one another, in order to make most effective and efficient use of taxpayers' money. Achieving complementarity requires not only a sound specification of the focus and expected value added of the Framework Programme, but also a critical assessment of multilateral programmes, and in particular the definition of clear goals and strategies of RTI policy at the national level.
- **Bridging between the silos of European policies:** The problem- and challenge-driven parts of FP9 will need to be much better tied to the goals and ambitions of other European policy areas. An integrated and coordinated approach is needed that relies on close interaction between FP9 and sectoral policies. This concerns not only the definition of thematic priorities and work programmes in FP9, but in particular also the mechanisms to ensure that the results of future R&I are effectively used and have an impact in terms of helping these policies achieve their future ambitions.
- **Building interfaces between the three pillars:** The Austria FP9 Think Tank underlines the necessity of improving the interaction and exchange between the three pillars of the Framework Programme as a means to enable the passing on of research findings to where they can be best exploited or serve as source of inspiration.
- **Exploiting the potential for synergies:** The different activities within FP9 need to become more than a collection of individual projects, but have to be moved to the next level of integration to achieve impact. It will be essential for the impact of FP9 to exploit

the potential synergies between projects within and across individual programmes.

- **Strengthening the strategic functions associated with the Framework Programme:** Targeted knowledge exchange and the exploitation of synergies are unlikely to happen without a proactive 'caretaker' who establishes the right linkages between different projects and initiatives. This is a particularly challenging task when it comes to exploiting the potential of research for purposes of innovation, for which a high level of strategic intelligence is needed.
- **Balancing openness and confidentiality:** The continued support for FP9 will hinge on the impacts it has on the one hand and on its openness, transparency and societal responsibility on the other hand. These claims need to be balanced with justified demands to respect confidentiality of research where deemed important for ensuring the competitive edge of beneficiaries.

2.4. General Approach

New interfaces and coordination mechanisms are needed in order to make sure that the different elements of the Framework Programme are better integrated in wider political ambitions, and at the same time a more stringent framing of CoRTIP is achieved for the European Framework Programme, which, we suggest, shall be based along the following main lines:

- Strengthen strategic coordination between the Framework Programme, national and multilateral R&I programmes
- Intensify mutual harmonisation between R&I policy and other European policy areas
- Strengthen the interfaces between the three pillars of the Framework Programme
- Enhance the openness and flexibility of the Framework Programme
- Establish a strategic programme management

- Make the EIC a strategic intelligence hub for advising a comprehensive innovation policy in support of CoRTIP

2.5. Specific Approaches and Measures

Strengthen strategic coordination between the Framework Programme, national and multilateral R&I programmes

Realising the European Research Area constitutes an essential element of a CoRTIP, but currently there is a lot of overlap and duplication between R&I activities at different levels, in particular when taking into account not only funding programmes but also institutionally funded research. At the same time, several member states see a need for more flexibility in engaging in joint ERA initiatives in line with national priorities (which of course presupposes that such priorities are clearly defined). Harmonisation and coordination between all three types of initiatives – Framework Programme, national and multilateral programmes – need to be ensured by way of joint governance processes and structures.

The following measures are suggested to address this:

- The governance structures of FPs, national and multilateral R&I programmes need to be better integrated in an ERA governance system. Within this system, the FP will be an instrument that is geared to specific functions within ERA. **Guiding principles** are needed to justify why certain areas are addressed best at European level ('European added value'), with the specific advantage of FP residing, for instance, in its scale and its potential to address research and innovation challenges of pan-European or even global reach.
- **JPIs shall be given more prominence** in the future in order to address certain R&I challenges in Europe more flexibly. This would allow member states to join R&I initiative of importance to their national policies and thus to prioritise their engagement. In particular, JPIs should play a more strategic role in areas where the FP cannot claim to be the most suitable approach, and where major

national institutional research capacities in selected countries can be drawn upon.

- A central role must be given to a revised **ERAC as strategic coordinating body among member states and the EC**. In other words, the EC will become a member of ERAC, which coordinates its priorities with those of the member states. If, however, ERAC assumes indeed such an important coordinating role, it must be endowed with the necessary competencies and resources deemed necessary for fulfilling its high-level function.
- This strategic coordination function is complemented by corresponding **coordination activities between EC and member states at the level of individual programmes**, following the successful experiences of the Standing Committee on Agricultural Research (SCAR) as an example. This requires full transparency of data about funding arrangements in the respective areas concerned, including data on other ERA instruments (Co-Fund, JPIs, JTIs, Art. 185, etc.).

Intensify mutual harmonisation between R&I policy and other European policy areas

The Austrian FP9 Think Tank has stressed that FP9 needs to have a clear focus on R&I and should be cautious not to engage in activities that fall under the remit of other policy areas. Without denying the importance assigned to the effective exploitation and upscaling of successful R&I actions (e.g. through start-ups, technology transfer, etc.) it is, for instance, questionable whether the FP is the right instrument to support major investments and innovations actions that are very close to the market. FP9 should maintain its focus on R&I and not make up for deficits in other policy areas. Instead, more effective measures to exploit its results for economic and social ends need to be foreseen in a range of sectoral policies that are in need of new impulses from R&I in order to be able to achieve their respective policy goals. In order to ensure the relevance of FP9 to innovation, strengthening interfaces with other such 'R&I using' policy areas seems

more appropriate than over-burdening the FP with instruments well beyond the reach of R&I policy.

We therefore propose the following:

- Better **coordination mechanisms need to be established at the interface between R&I policy and other sectoral policies**, where the demand-side conditions for the uptake of R&I results or important pre-conditions for enabling R&I are defined. Sectoral policies contribute to the definition of the R&I priorities in the Framework Programme, but too little attention has been paid to the creation of supportive conditions for enabling the uptake of R&I results. It is proposed that the exploitation of the outputs and outcomes of FP9 should be improved by defining clear interfaces with sectoral policies and their regulatory and investment strategies (e.g. environmental research and environmental regulation) as a means to help improve the impact of R&I from the demand side (see e.g. the recently launched Innovation Deals), rather than through broadening (and thus diluting!) the ambitions of FP9.
- Exploiting the potential synergies between FP and ESIF/Structural Funds has been an issue of concern for many years. In order to clarify their respective remits, it is suggested that
 - targeted R&I projects and initiatives should be addressed by FP, whereas the **advancement and consolidation of R&I infrastructures, start-up and similar financing can well be placed within the frame of Structural Funds** (or other financing mechanisms can be used, including risk finance), underpinned by harmonised financial rules and regulations between the two actions (often aggravated by a diversity of national peculiarities). We also suggest using ESIF to support the **marketability of highly ranked innovation project** results from FP9 and that cohesion countries can **make use of ESIF for participation in JPIs and ERA-NETs**. Moreover, ESIF should be freed from state aid rules if funds are used for real R&D.

- shortcomings from the past programming and implementation of the Structural Funds that prevented the potential creation of synergy effects between the different programmes should be avoided. This refers to very different issues, such as ineffective programming and pseudo-alignment efforts. By building the R&I base in less advanced countries and regions of the EU with the help of ESIF/Structural Funds, the foundations will be laid to extend the reach of Framework Programmes to the entirety of the ERA.

Strengthen the interfaces between the three pillars of the Framework Programme

As a research and innovation programme, FP9 needs to cover the full spectrum from basic/frontier to problem-centred research (either geared towards enhancing competitiveness or tackling societal challenges). The three-pillar structure of Horizon 2020 ensures that this breadth is covered, and each of the pillars should have a clear focus. However, this overarching structure should be strengthened by 'matching' elements within and across the three pillars. The following changes are suggested:

- Basic and frontier-research, creativity and serendipity are not only needed in the 'Excellence' pillar of FP9, they are also needed in relation to key enabling technologies and societal challenges. Moreover, the advancement of research results from ERC and FET projects need to be supported by appropriate instruments to bridge to application. In operational terms, **a share of the funding volume in KETs and societal challenges should be used for basic research and for research to understand and anticipate future challenges**, complementary to the more general ambition of realising solutions-oriented research.
- In addition, it must become easier to hand over research results – either research findings or new insights into research needs – across the different pillars. A strategic programme management

- (see below) will have to play an important role in ensuring learning and knowledge exchange between different parts of the FP9, for instance by way of **thematic and cross-disciplinary networks**.
- Some specific gaps within the current set-up of Horizon 2020 need to be addressed. This applies to COST Actions, which represent an important element for nurturing the research landscape by supporting the formation of thematic research networks in emerging areas of science and research. Such **thematic networks should be strengthened and integrated efficiently in the first pillar of FP9**.
 - By enabling collaborative bottom-up frontier-research, the FET programme represents an important complement to investigator-driven research, but has been largely restricted to ICT-related research. It is recommended to **expand the FET programme not only formally but also effectively to all areas of research and innovation**, endowed with appropriate resources.
 - In view of the growing weight of the social dimensions in all domains of research, SSH needs to be given **a more important role** along two main lines. First of all, dedicated SSH research is needed to address some of the fundamental societal challenges Europe is being confronted with (e.g. in relation to welfare, migration, the future of work, social divides and identity, but also to support European policy-making through policy studies). Secondly, SSH perspectives are essential for anticipating and framing societal tensions and conflicts in relation to scientific-technological research endeavours, which may ultimately lead to a stalemate in innovation and development.
 - The EIT has been given a key role in strengthening the education element in relation to R&I. The results of a forthcoming systematic benchmarking with existing initiatives shall be the basis for shaping the future integration of education in FP9. The importance of preserving a strong education and training element supporting research and innovation in future FP9 is in any case fully recognized. Review of ongoing and up-coming evaluations shall be used to **cri-**

tically assess the achievements and limitations of the EIT,
while leaving all options open.

Enhance the openness and flexibility of the Framework Programme

The nature and practices of R&I are changing, which means first of all that new types of actors can play an important role in R&I activities, and secondly that higher societal demands and requirements are being placed on R&I. The EU FP needs to respond to these changing requirements and expectations.

It is suggested that:

- The notion of responsible research and innovation (**RRI**) **should be fully recognised as a guiding principle across all pillars of FP9**. In operational terms, this should not be interpreted as every project having to fulfil all RRI principles, but rather they should be applied to the programme level, where the strategic programme management needs to ensure respect for RRI principles (integrity, openness, gender equality, public engagement and science education).
- Research and innovation activities in FP9 need to be more flexible and open in **enabling the integration as needed of other actors than the established research-performing organisations** like universities, research organisations, and industry. Non-governmental organisations, cities, users and in particular international partners (see Section 4) should become important players in European R&I. To support this involvement, a new open innovation project type should be established in FP9. It should create spaces for experimentation and also enable and empower social and organisational innovation (incl. living labs, sandpit formats etc.).
- In operational terms, this requires **greater flexibility of EU FP participation rules**. Although a great deal of simplification has been achieved with Horizon 2020, the administrative burdens on the project participants are still inappropriately high. Not only do

they lead to growing share of resources being spent on the administration of R&I rather than on the actual doing of R&I, they also lead to delays in the implementation of research activities, and risk-averse behaviour of applicants. This problem is even more pressing for other ERA-instruments for which simplification has not yet been high on the agenda.

- While transparency is certainly a must in publicly funded research, the costs and benefits of applying rigid and highly demanding rules of the court of auditors need to be carefully balanced in a context, where uncertainty and risk-taking are essential characteristics of the core activities. It is recommended that an **evaluation of the role and impact of the court of auditors for the performance of research in European** shall be conducted.

Establish a strategic programme management

With the growing complexity of the overarching research challenges, in particular in the KETs and societal challenges pillars of Horizon 2020, the combination and integration of research results from individual projects acquires greater significance than in the past.

This means that a strategic programme management needs to be established at the level of individual programmes. The management would integrate all strategic functions along the research, technology and innovation chain and oversee the entire process from strategic programming and work programme design to implementation, evaluation and exploitation of findings, which all constitute parts of a continuous learning and improvement process. It governs the programme implementation in close collaboration with implementing agencies, both at EU and national levels, and ensures that the programme concentrates its funding on clear priorities and delivers more impact than just the sum of individual projects.

More specifically, this strategic programme management has the following functions to fulfil:

- To prepare the **development of work programmes on the basis of sound strategic intelligence (e.g. mapping, foresight,**

monitoring, evaluation) and transparent interaction with stakeholders and potential users of research results (including other Commission services).

- To apply measures for the **concertation of research projects** in specific parts of the work programme in order to ensure that projects work towards commonly-agreed objectives in a mutually enforcing way. That implies regular concertation meetings and an assessment of results at the level of the work programme.
- To ensure **'match-making' with research in adjacent areas of FP9, as well as with relevant research in national or multi-lateral research programmes**, for instance through the working groups of a reformed ERAC.
- To support the exploitation and scaling up of research results of the FP through **maintaining close ties with European sectoral policy DGs and with the communities of potential (pilot) users** and stakeholders of research. To support R&I policy by **integrating relevant insights from ongoing research activities** and feeding them into the respective policy-making bodies. This approach of continuous policy learning is particularly important for research on major societal challenges.
- As a consequence, the strategic programme management also needs to maintain **close links with the different Commission services**, in order to make sure that insights from funded research can be effectively fed back into policy making and policy preparation.
- In organisational terms, it is suggested that the strategic programme management functions be established at DG R&I, to install interfaces with other Commission services, member states and societal stakeholders through **joint standing committees**, and thus contribute to better integrating EU and member state activities.

Make the EIC a strategic intelligence hub for advising a comprehensive innovation agenda in support of CoRTIP

Complementary to the strategic programme management, a strong strategic intelligence function (strategic intelligence hub) is needed that is situated at the level of general innovation policy and in tasks cutting across specific programmes and policies. It is suggested that the European Innovation Council be entrusted with this function as (one of) its main role(s). More specifically, this implies the following:

- **Monitor the performance of innovation in Europe**, but – in close cooperation with OECD and other international organisations – also globally. The (strategic intelligence hub SIH should ensure an in-depth awareness of what is going on in RTDI worldwide and contribute to adequate evidence-based European RTDI strategy and programme development.
- Inform and **report to the various key bodies in charge of innovation policy development and implementation**, in particular ERAC, strategic programme management groups, other DGs than DG RTD, as well as other European institutions like the European Parliament and the European Council.
- Play the role of a strategic knowledge interface between DG RTD and sectoral DGs in order to enable better policy coordination on matters of innovation. In particular, the EIC would oversee risk-financing and start-up policies, the demand-side conditions for innovation and its upscaling, in particular as far as regulatory and other framework conditions at European level are concerned. Moreover, **it identifies important deficits and challenges for enabling innovation and its upscaling**, be it research-led or demand-led, and advise on appropriate strategies to address these. In other words, it would have a strong focus on instruments and developments beyond the reach of FP9, but take innovation-related initiatives within FP9 into account as well.
- An EIC with this kind of role would require a **different organizational setting** (and probably also **composition**) than foreseen

today, i.e. in particular it would need to be equipped with a secretariat with sufficient resources to fulfil these tasks of EIC. Consequently, though, we do not favour the EIC itself to be equipped with any evaluation or selection capacity.

3. Fostering Positive Impacts

3.1. Starting Position

At a time when Europe faces a multiplicity of economic and societal challenges, a substantial increase in budget for research and innovation is needed. In order to safeguard the effectiveness, transparency and accountability of public spending, a shift in perspective is necessary: from activities and scientific outputs to economic and societal impacts; from managing individual projects to governing project landscapes; from administrative procedures to strategic management. However, the term 'impact' is multifaceted and calls for a shared and sound understanding among all actors involved. It should comprise economic, environmental and societal impacts; short, medium and long term impacts; intended and unintended impacts; direct, indirect and systemic impacts.

3.2. Focus of this Section

- FP9's structure and funding instruments need to **ensure that positive impacts are increased** and potential negative impacts are reduced or avoided.
- Europe should take the **pole position in addressing societal challenges** in line with the 2030 Agenda for Sustainable Development.

3.3. Fundamental Requirements and Principles

- **Ensure a substantial increase in budget:** Given the challenges Europe is facing, we strongly recommend a substantial increase of the budget of FP9 in the order of €130 bn despite a reduced number of member states and tight (national) budgets. This demand is nevertheless justified by the challenges of increased competition from other regions of the world, the societal challenges like climate change, security and others, and the new type of mission-oriented

policy we advocate all ask for such a substantial change towards a stronger European RTI policy and agenda. An adequate budget size will also ensure that the top research teams and companies will stay involved in the programme and the best proposals can be funded with a reasonable success rate (accompanied by measures to raise the success rate, such as more two-stage-proposals and fewer topics, selected on the basis of better alignment and division of labour with the MS). In addition, a substantial increase of the FP budget will also serve as leverage to increase national efforts.

- **Concentrate on what is essential:** The impacts of FP9 can be substantially increased if all relevant R&I policies are aligned towards the shared vision and if complimentary areas and budgets are combined. We must have the courage to set priorities and accept that the FP is not big enough to cover (almost) everything, but should be equipped with substantially higher finances in order to achieve impact in the relevant focus areas.
- **Define a few, but SMART objectives:** In order to steer action, objectives and targets need to be *SMART* – Specific, Measurable, Attainable, Realistic and Timed. While the recent performance indicators mainly focus on participation patterns, success rates and outputs, the objectives of FP9 will have to highlight impacts as well. Therefore, a lean but effective monitoring system will be required.
- **Ensure substantial and continuous commitment:** The transition of socio-technological systems and societal practices need time and well-coordinated efforts (e.g. energy transition, mobility systems). The European FPs play a decisive role in these transition processes as initiators, enablers and promoters. Instead of focusing on the micro-management of individual projects, novel instruments are required that would allow for substantial and continuous involvement in and steering of long-term transition processes.
- **Participation and Inclusion:** If European research and innovation policy is to safeguard its legitimacy vis-à-vis European citi-

zens, participatory elements and an inclusive approach (at least in areas where societal issues are addressed), are vital. Involving end-users, citizens and a broad diversity of other actors can boost innovativeness, speed up dissemination processes and help to develop new business models and social innovations.

3.4. General Approach

In the three pillars of Horizon 2020, impacts were considered in rather different ways: in 'Excellent Science', impact was mainly understood as an increase of scientific output and excellence (measured by publications, citations and careers); in 'Industrial Leadership', positive impacts on growth and competitiveness were in focus (while negative impacts and wider societal impacts were only rarely addressed); in 'Societal Challenges', a broad variety of references to policy documents and rather broad policy scope lead to a diverse and detailed reference framework (that was only used for proposal selection but hardly for ex-post evaluations). This variety of expected impact approaches runs the risk of lacking coherence, weakening controllability and reducing impacts. Four streamlined groups of measures are therefore needed to foster the positive effects of FP9:

- dedicated smart programme features
- better uptake of frontier-research results
- societal outreach and sustainable development
- effective collaboration with the business sector

3.5. Specific Approaches and Measures

Increased impact through dedicated smart programme features

Compared to previous FPs, Horizon 2020 showed a significant shift towards decentralisation (ERC, JTI, P2Ps, outsourcing of project administration to agencies). In order to ensure effectiveness, controllability and coherence and to counter potential silo effects, dedicated smart programme features

are necessary, which shall be overseen by a **strategic programme management**. They are also required to ensure an increased impact of FP9:

- **Impact strategies:** Previous FPs and Horizon 2020 put most of their emphasis on managing individual projects, while mid and long term effects were beyond their time horizon. Given that most of the impacts occur within a certain time after the projects have ended, impact strategies for FP9 and its priority areas are required from the very beginning. They should foster exchange, synthesis and joint exploitation of project groups and link up with the strategic programme management. In order to increase impact, the strategic programme management should utilise flexible interventions during and also after the project running time. A better project impact monitoring on the basis of all the three programme pillars should be developed and implemented.
- **Impact monitoring** should go beyond measuring activities, publications and collaboration patterns, and rather foster impact orientation also considering and mitigating potentially negative impacts (Technology Assessment).
- **Continuous learning and evaluation culture:** The implementation of FP9 must be transparent, coherent and well-documented so that all necessary data for evaluation and learning is generated. FP9 should follow a learning oriented approach, react to future developments and adapt its structures, instruments and content on the basis of profoundly informed decisions. Therefore, sufficient resources are required as well as the granting of independence to the services responsible for monitoring and evaluation. Coherent monitoring and evaluation procedures across the FP and all the initiatives funded or co-funded by it should be established, and evaluation purposes, criteria, questions and report formats should be harmonised. Individual evaluations should be better planned and utilised to build up a coherent knowledge base that allows for continuous improvement. More focus should be given to quality control and standardisation in contracted evaluations to ensure that

they can be used as the evidence base for strategic decisions. Furthermore, a rigorous approach to evaluation syntheses and meta-evaluations should enable systematic access to findings and ensure a better quality of evaluations.

Increased impacts through better uptake of frontier-research results

The European Research Council (ERC) has been uniquely successful in promoting excellent frontier-research, in leveraging different research strengths through its competitive funding and in attracting and retaining outstanding researchers. It has had positive impacts on National Research Systems by awarding grants to highly competitive individual researchers through a European-wide competition. The ERC itself has become an important institution and a major player in R&I policy in Europe and beyond. However, there are certain shortcomings that should be addressed in FP9 to ensure better usage of frontier-research results:

- **Foster linkages with other pillars and areas:** Europe should increase its efforts to translate research results into technology, products and competitive advantages. Considering societal impacts and involving civil society in frontier-research is often perceived as risky (diluting excellence, distracting from scientific output, reducing academic reputation), useless (lack of knowledge or legitimacy) or difficult (complex participation procedures). Linking up with the business sector and other societal actors is perceived as potentially undermining academic independence. However, new solutions for making the results of ERC research available, understandable and exploitable to technological communities across Europe are needed.
- **Foster collaborative frontier-research:** The funding instruments of the 'Excellent Science' pillar mostly focus on the individual researcher or grantee. While this accords perfectly with the attribution of excellence to individuals (which dominates the logic of academia), it does not sufficiently embrace the importance of re-

search teams for ground-breaking discoveries. Therefore, additional funding schemes for collaborative frontier-research should be fostered, namely through more ERC synergy grant calls and FET actions. Elements of the Marie Skłodowska-Curie actions should be taken up by the collaborative funding schemes in the other two pillars in order to also promote researchers' mobility in collaborative research projects.

Increased impacts through broader societal outreach

FP7 and Horizon 2020 have already started the development of a mission orientation in Framework Programmes. However, the intervention logic and programme designs of Horizon 2020 for the third pillar are still based on the intervention logic of previous technology-centred Framework Programmes. Themes and topics often follow a technological 'fixing-the-problem' approach instead of addressing major transformation processes. The participation of citizens and civil society (organisations) in FPs is also only marginal. In order to harvest the full potential of FP9, address citizen concerns better and involve them in a more substantial role several measures are required:

- **Ensuring an effective orientation towards societal challenges:** The three-pillar model of Horizon 2020 has proved to be successful and should be kept for FP9. While linkages between the three pillars should be fostered, we recommend keeping them separate (no merging of the second and the third pillar under the headline of 'mission oriented research'). The three pillars follow different logics, address different target groups and form an effective portfolio for R&I with a European added value. Furthermore, at least one third of the FP9 budget should be allocated to the third pillar in order to address the grand societal challenges. Funding for both the creation of new knowledge relevant for understanding societal challenges and the development and implementation of new solutions shall be part of FP9. When designing new or adapting existing funding instruments, the complexity of societal challenges (i.e. 'wicked problems') must be considered. In addition to techno-

logical and product innovations, social and procedural innovations are therefore needed.

- **Responsibility and Sustainability:** The 2030 Agenda for Sustainable Development should serve as a framework for the whole FP9 in general and for further orientation of the third pillar on societal challenges in particular. In order to avoid agenda setting being driven by interest groups, FP9 should focus on a limited number of Sustainable Development Goals (SDGs) that are highly relevant for Europe and whose fulfilment heavily depends on research and innovation. For these goals, specific research agendas should be developed. Furthermore, an effective SDG-monitoring system should be established that goes beyond the currently used impact indicators and that spans across all three pillars. In addition, responsible research and innovation has enriched the traditional view of excellence in research with consideration of societal responsibility and institutional change. It should therefore become a guiding principle in all three pillars and themes of the FPs with solid mechanisms to strategically embed it throughout and across FP9.
- **Inclusive and open to the people:** Although participatory elements have been strengthened, a perception remains that research agenda setting and work programme development is often taking place behind closed doors while highly important concerns of European citizens are only being marginally addressed. This can increasingly jeopardise the political and social acceptance of public expenditure for European research funding. Citizens and stakeholders should therefore be engaged in a dialogue about the purpose and benefits of research and the way it is conducted. Citizens should be involved in a broader range of roles, such as in proposal evaluation boards (at least for the 'impact' section), agenda setting and work programme development (beyond online-based consultation processes), and in ethics boards and steering committees. Inter- and transdisciplinary aspects (going beyond technology-driven solutions) need to be strengthened and systemic approaches are required. Arenas for knowledge co-creation and innovation need to

be designed in which a broad variety of stakeholders should be involved, such as lead-users, NGOs, clusters, entrepreneurs, the media, venture capitalists, business angels. Furthermore, the gender balance and the representation of women on all levels, and the integration of gender into the research content should be fostered.

- **Appropriate funding instruments:** For a straightforward and enabling inclusion and participation of non-conventional actors (e.g. NGOs, user groups, start-ups, public or semi-public utility providers and citizen scientists) new dedicated rules and procedures need to be developed. Red-tape and financial burdens must be reduced for such actors as far as possible. Clear procedures need to be defined to enable a transparent space for participation of external stakeholders. Such spaces should be designed in a way as to prevent singular and non-transparent lobbying activities. Especially the so-called ERA-instruments, including JTIs, PPPs, EIPs, Art. 185, etc., tend to lack a sufficient level of transparency in terms of agenda setting, lobbying, and decision-making (including funding decisions). Since they are in substance joint programming based, they should also be addressed by one basic instrument (ERA-NET co-fund). Lacking transparency in view of cascade funding is another concern. Information on results of calls i.e. on funded projects should be integrated in the general FP data bank system (CORDA).

Increased impacts through effective collaboration with the business sector

The previous Framework Programme and H2020 succeeded in extensively involving both large corporations and SMEs through increased public-private-partnerships (PPPs) and SME specific programmes. However, analyses of participation data showed a large diversity of participating companies and thus the need for a better focus on the relevant target groups. In order to increase the positive impacts on growth and competitiveness of the European economy, the following measures are recommended:

- **Avoiding market-distortions:** In order to avoid distortions of competition, FP9 should concentrate solely on funding pre-competitive activities. Support for risk financing or market launches should be only part of economic or structural policy instruments, but not of future FPs. At the same time, we acknowledge that risk finance measures are most important to complement prior R&D efforts in order to develop multiplier effects. Pilot projects and demonstration projects should be supported only if they substantially contribute to solving grand societal challenges or if they are necessary because of scale effects in globalised markets, but not if they are implemented by individual companies aiming at commercialisation and profit.
- **Better alignment of business oriented R&I support:** In order to offer support along the whole implementation and exploitation chain, a better alignment of FP9 with business oriented R&I support on the national level is required, especially in the area of SME support, venture-capital and the support of start ups. This encompasses EFSI, the instruments of EIB and potentially ERDF as well.
- **Foster co-development and co-creation:** Following an advanced open innovation paradigm, FP9 should foster the collaboration of science and the business sector already in research agenda-setting and research design, support ecosystems for co-creation (such as innovative businesses, innovative markets, innovation hubs and networks) and aim at making universities and research organisations more entrepreneurial.
- **Fine-tuning of the dedicated funding schemes:**
 - Regarding the **participation of SMEs**, the main share of SME related funding goes to highly innovative SMEs with a strong scale-up potential and not to consultancies and networks. Coherence with national and European rules on competition and state aid is requested.
 - **Bottom-up RTI measures in general** (with an emphasis on start ups and SMEs) should be provided for. For bottom up measures, subsidiarity and complementarity must be the

guiding principles – including all levels of policy intervention (European, national, regional, intergovernmental/EUREKA/Eurostars). Therefore the focus shall be put on activities with specific European added value.

- **PPPs and cPPPs** are effective instruments to support innovation along a well-defined and needs-oriented intervention logic. They are key for long-term collaboration of institutions and allow pooling of public and private funding. However, their transparency and accessibility need to be ensured.
- **P2Ps and ERA-Net instruments** should be continued as they are important instruments to jointly set priorities, achieve a critical mass, ensure strategic orientation and involve important actors on EU and member state level. Longer-term instruments are needed instead of one-time instruments, e.g. repeated joint calls.

4. A Strategic Approach and Adequate Instruments for Sustainable Collaboration with Third Countries

4.1. Starting Position

Openness and engagement with the world and fostering international cooperation in research, technological development and innovation (RTI) must be a strategic priority for the EU's overall RTI policy. Changes in the global research landscape and the emergence of new knowledge powers make international cooperation a must for ensuring excellence and competitiveness.

4.2. Focus of this Section

- FP9 should provide researchers working in the EU the opportunity to cooperate with the best fellow colleagues from all over the world.
- The EU should position itself as leading actor in global challenges system's research.

4.3. Fundamental Requirements and Principles

- To achieve these main objectives, international cooperation should be firmly anchored, empowered and exercised at European level to drive forward the European RTI internationalisation agenda. Cooperation between the European Commission and member states as well as between member states should be sought whenever meaningful.
- RTI internationalisation should be based on a strategy with strategic guidelines for international RTI opening up and RTI coopera-

tion⁴. These strategic guidelines should reflect the ambiguity of international RTI, which possesses advantages but can also lead to leakage of strategic and first-mover knowledge. Thus, IPR issues must be considered from the onset. The degree of R&D cooperation and openness should take the different types of research and research areas into account. It should be considered whether quotas could be an instrument for steering this differentiation. The guidelines should also contain principles along which international RTI cooperation should be designed and implemented (e.g. to strengthen resilience and development capacity in crisis region; to tackle global challenges scientifically etc.). The strategic guidelines should become an integrated part within the Common RTIP, and thus binding for the different RTI affiliated Directorate-Generals of the EC ('Research Family').

- Such strategic approach requires strategic intelligence regarding STI developments worldwide, which should be pooled in an international RTI observatory by addressing and sourcing from different resources (INCO project portfolio, INCO Service Facility, SFIC, MS etc.). Strategic intelligence should include a broad spectrum of activities such as evaluations, reviews, foresight, information gathering and monitoring, specific studies etc. It should provide a sound and continuous knowledge base for planning, implementation and accompanying review of international activities and the strategic RTI internationalisation guidelines. The international RTI observatory should be established in DG R&I and supported by a consortium of expert institutes in MS enabled to follow developments of research and innovation worldwide and to provide input by drawing on expertise from EU and MS science counsellors world-wide.
- Strategic intelligence should serve also a central high-level directorate in DG R&I. This directorate must have a clear cross-cutting mandate for the efficient and effective coordination and monitoring of the implementation of international cooperation under FP9.

⁴ RTI cooperation and RTI internationalisation and opening up need to be differentiated.

- MS should strengthen their cooperation in variable geometry arrangements as well as the cooperation with the Commission in programming, monitoring and review of international activities in order to overcome the fragmented presentation of Europe and the waste of resources due to parallel activities below critical mass.

4.4. General Approach

So far, the EC followed a 'dual approach strategy' focusing on the general opening up of instruments on one hand and on targeted international activities on the other. This duality should continue in FP9 but complemented by, firstly, a specific 'RTI for development' initiative, secondly, by cooperating with multilateral RTI internationalisation initiatives of MS and, thirdly, by promoting the global visibility of European research.

The international RTI cooperation advantages should be legitimised by clear attributional advantages for the EU⁵ but also win-win advantages for the EU and the international partners should be actively sought.

To sum up, the new RTI internationalisation approach should be based on five pillars:

- General opening up of FP9
- Targeted cooperation with industrialised countries and emerging economies
- RTI for development initiative
- Cooperation with multilateral MS initiatives
- Promotion of European research

⁵ These are in case of Horizon 2020:

- Strengthening the EU's R&I excellence, attractiveness and economic and industrial competitiveness
- Tackling global societal challenges
- Supporting the EU's external policies

4.5. Specific Approaches and Measures

General opening up of FP9

The general opening up approach, operationalised as main-streaming of international cooperation in Horizon 2020, is considered to have been unsuccessful and to have had low awareness and impact in achieving a sustainable position for Europe as a global player. The main reason is the abrupt change in the funding regime for third countries, the dismissal of the INCO support portfolio and the reluctant take-up of internationalisation by thematic units within the EC Directorate-General for R&I. Therefore, the following specific measures are suggested:

- In every R&I call, which is strategically 'cleared' and suitable for RTI internationalisation, each R&I project selected for funding should be able to apply for and use in a bottom-up way up to 5% of its overall budget as a contingency reserve for international RTI cooperation activities. This budget should be used according to the project's goals and strategy to access overseas excellence and knowledge (including infrastructures) and to perform international outreach and exploitation activities. It should be used to cover overseas travel costs, honoraria/subcontracts, event costs etc. (also for researchers from 3rd countries). If justified, also higher funding rates for international activities (up to 15%) should be allowed for R&I projects.
- The international activities of the ERC should continue.
- The international dimension within the current MSCA portfolio should be enhanced. The level of subsistence costs should be regularly updated to achieve cost truth.
- Thematic European networks, such as COST actions or equivalent CSAs, should be enabled to involve also international partners if strategically beneficial for the EU.
- EUREKA Globalstars should be supported via Art. 185 co-financing, provided that bureaucratic efforts are simplified. EUREKA Global-

stars should act as a flexible applied RTI cooperation instrument to allow different single joint applied R&D calls with third countries.

Targeted cooperation with industrialised countries and emerging economies

Targeted international RTI activities refer either to specific pre-defined partner countries or regions or specifically targeted themes. Although the Horizon 2020 approach of strategic programming and roadmaps, including flagship initiatives for collaboration with targeted third countries, is promising, it will be necessary to develop an even more strategic, pro-active and enduring approach based on timely negotiations and agreements.

- Strategic RTI agreements and roadmaps should be further developed with individual top-priority countries. The EU member states should be involved in this process. The RTI agreements should serve science diplomacy goals of the EU, based on strategic intelligence, but should go beyond dialogue formats and become more specific and operational to facilitate concrete R&I initiatives, programmes and activities. They should include co-funding arrangements by third countries for their participation in FP9 and/or measures of reciprocal access to their programmes where appropriate. They should also create the ground for the development of joint calls and longer term joint programmes as well as for joint institutes or infrastructures with a clear global added value. The agreements should be designed and implemented in a way so as to generate impact through better promotion, better up-take and ownership by the target groups, regular communication between the EC and the partner country, and simplified procedures along the principles and regulations of FP9. Co-existence of different funding rules on the part of the EC and the partner country must be avoided or at least reduced as far as possible.
- The EU is a global player and therefore should provide dialogue and cooperation formats to the whole world. The general opening-up approach is in service for this, but it is not sufficient to meet

RTI policy dialogue demands. These kinds of more policy-oriented formats should be in service of science diplomacy of the EU, supported by strategic intelligence services, and operationalised through a reformed project portfolio for international cooperation. The CSA formats should primarily address entire regions (e.g. Eastern Partnership Countries, ASEAN etc.), but with significantly greater budgets than those allocated to the previous INCO-NETs. The costs of medium-income or low-income third partner countries within these CSAs should be financed too.

- The European Commission should take the global lead to initiate, design, kick-off and implement a few large thematically-targeted flagship initiatives with strategic partner countries and regions to tackle global challenges systematically and sustainably. Systemic interdependencies, rebound and reciprocal effects need to be addressed. Unintended negative effects (e.g. through isolated R&D or technical interventions) should be identified and solutions on higher systemic levels attained. Such activities should be strategically embedded in pillar 3 of FP9.
- In addition to being a world-wide leader in global challenges system's research (see point above), the EU should carefully reflect and be in a position to either initiate or get involved in selected global RTI initiatives that are strategically beneficial for Europe's RTI strategy and that are based on shared efforts.
- Specific further measures for co-operation with different countries and regions, e.g. European Centres for Research and Innovation, should be facilitated by taking into account the level of maturity of the RTI systems of third countries as well as the breadth and depth of existing co-operations and the strategic goals towards a future co-operation.

RTI for development (RTI4D)

As of FP2, RTI4D played a role in the European Framework Programmes but became gradually marginalised in the last two FPs. On the other hand, more

and more developing countries are aware about the eminent contribution of RTI to societal development and economic growth.

- It is suggested that a strong RTI4D programme be established within the EC's development cooperation competence that should make use of the next FPs professional capacities (e.g. in terms of evaluation, strategic intelligence, programme management and monitoring etc.) and that should be aligned as far as possible with FP9 research implementation and research management standards (RRI, open access, proposal application tools, funding rates, instruments etc.). The RTI4D programme should support thematic RTI4D projects but also provide structural support for the establishment and upgrading of RTI systems, programmes and procedures through training, consultancy, peer reviews and pilot initiatives in developing countries. The financial allocation for this RTI4D programme should come from the development cooperation budgets.

Cooperation with multilateral MS initiatives

- Extended Joint Programming Initiatives should become a central instrument to strengthen international RTI cooperation between MS and the European Commission vis-à-vis targeted third countries or regions through sustainable co-funding arrangements and interlinking of activities with other international activities under FP9. JPIs should play an important role in that respect also in relation to flagship initiatives as defined in roadmaps or strategic cooperation agreements with third countries.
- Other emerging RTI Internationalisation initiatives suggested by and coordinated across several MS should be co-financed by the European level if they are in line with the overall European RTI internationalisation strategy.
- Through the work of SFIC, the MS' internationalisation strategies and initiatives should be aligned where appropriate and concise

communication of available funding possibilities should be ensured. Monitoring activities should be included.

- SFIC should be able to access the international RTI observatory. It should also contribute to it. SFIC should also be in the position to commission studies etc. to cover the information needs of several MS by using the INCO Service Facility.

Promotion of European research

In order to overcome the fragmented presentation of Europe on a global scale and to reduce the waste of resources due to parallel and uncoordinated activities below critical mass, a more strategic and comprehensive approach is necessary to ensure and promote the global visibility of the European Research Area. This should go beyond scattered activities of 'Destination Europe' and 'Tour of...' and should complement EURAXESS.

- Centrally coordinated research marketing actions and structures at the European level ('Europe as a brand') should engage MS to present European research worldwide and promote Europe as an attractive region for top researchers from all over the world. The INCO Service Facility should be employed for this.
- Provided a positive 'clearance' from a strategic point of view, advantage of the competitive strengths of some European research infrastructures should be taken and international access promoted and exploited. Such selected infrastructures should be developed as attraction points for international talent and advanced researchers. In line with the strategic RTI guidelines and the Common RTIP, their international access dimension should be sustained and they should be strategically positioned as international flagships of the ERA.

Glossary

ASEAN	Association of Southeast Asian Nations
CORDA	Common Research Data Warehouse
CoRTIP	Common Research, Technology and Innovation Policy
COST	European Cooperation in Science and Technology
CSA	Coordination and support actions
DG	Directorate-General
FET	Future and emerging technologies
FP	Framework Programme
EAV	European added value
EC	European Commission
EIB	European Investment Bank
EIP	European Innovation Partnerships
EIT	European Institute of Innovation & Technology
ERA	European Research Area
ERAC	European Research Area Committee
ERDF	European Regional Development Fund
ERC	European Research Council
EFSI	European Fund for Strategic Investments
ESIF	European Structural and Investment Funds
EU	European Union
ICT	Information and communication technologies
INCO	International cooperation
JPI	Joint Programming Initiative
JTI	Joint Technology Initiative
KET	Key enabling technologies

KIC	Knowledge and innovation communities
MS	Member state(s)
MSCA	Marie Skłodowska-Curie Actions
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
PPP	Public private partnership
cPPP	Contractual-PPP
P2P	Public-to-public
RRI	Responsible research and innovation
RTDI	Research, technology, development and innovation
RTI	Research, technology and innovation
RTI4D	RTI for development
R&I	Research and innovation
SCAR	Standing Committee on Agricultural Research
SDGs	Sustainable Development Goals
SF	Structural Fund
SFIC	Strategic Forum for International Science and Technology Co-operation
SIH	Strategic intelligence hub
SME	Small and medium-sized enterprises
SSH	Social, sciences and humanities
STI	Science, technology and innovation