



The next EU Framework Programme for Research must reinforce the EU's innovation capacity

ERT's suggestions for FP8



Introduction

The future Framework Programme and the EU's innovation policy

More than ever, the EU faces the challenge of finding new ways to boost its economic growth. As public debt burdens continue to worsen, economic growth will be the key factor in bringing the EU back to a road of economic and fiscal sustainability. Economic growth can only be achieved if the global competitiveness of the European economy is ensured.

As *ERT's Vision for a competitive Europe in 2025*¹ underlines, an innovation-driven Single Market is the key to ensuring that Europe remains globally competitive and an attractive place to live and work for its citizens.

Despite its central role in ensuring Europe's economic future, innovation has until now received less attention than it should have: overall expenditure on R&D in the EU continues to stagnate just below 2% of GDP, continuously missing the annual target of 3% set in 2002. This trend must be addressed if innovation is to become a growth driver for the EU. In this regard, the proposed Innovation Union is very important.

An ambitious innovation policy, flanked by complementary measures in other policy areas, is required to reinforce Europe's capacity to innovate. This policy should have the following characteristics:

- Strengthen the emphasis on applied R&D, validation and demonstration of innovations and reinforce the link between research and future market demand to increase the impact-orientation of R&D activity in the EU.
- Reduce the fragmentation of European research and innovation systems.
- Promote private R&D investment in the EU.
- Look at public R&D and innovation funding as investments and partially reallocate EU funding from more consumptive uses (e.g. agriculture) towards measures genuinely designed to boost competitiveness and reinforce Europe's knowledge-based economy.
- Increase business participation in the EU's current and future Framework Programmes.
- Ensure the sufficient future availability of talent by encouraging education in maths, science and technology subjects. The business community is stepping up efforts to contribute to this objective.
- Strengthen links between the public and private sectors in education with the support of the business community.
- Reinvent public procurement – a significant source of demand in the EU – as a strategic driver for the development and implementation of new technologies.

¹ Launched in February 2010; available on www.europeontrack.eu

The key policy challenge in this area is to improve the EU's capacity to turn research into innovation. Companies can play an important role in this regard, including through the EU Framework Programmes for Research. However, the share of company participation in the Framework Programmes continues to decline. To address this situation, a re-shaped Framework Programme is a crucial component of an ambitious EU innovation policy. The impending discussion on the shape of the future Framework Programme ('FP8') is therefore a welcome opportunity to further improve the EU's approach to research, development and innovation, building on the recent reform of the 7th Framework Programme.

As one important aspect of the EU's innovation policy among several, the next Framework Programme should reinforce the innovation potential of the EU's Single Market. The future Framework Programme's objectives should focus on the Grand Challenges; a more explicit overall objective of creating sustainable economic growth would increase industrial and societal relevance. Active company participation should be encouraged as a way to strengthen the capacity of EU R&D to drive innovation activity and to reinforce EU excellence in areas with industry relevance.

ERT's Vision for a competitive Europe in 2025 makes some preliminary recommendations on this subject as well as other ways of unleashing Europe's innovative power. Building on the ERT Vision, this report outlines more specific ERT recommendations on the setup of the future EU Framework Programme for an improved EU research and innovation performance. Based on expert input from company R&D specialists, it makes recommendations on the orientation of the future Framework Programme, its governance, its modalities, the competence base it draws on, and proposes some new approaches. The key recommendations are listed on the following pages.

Acknowledgements

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Key recommendations

1. Orientation of the future Framework Programme

- Strengthen focus on those Grand Challenges where the EU can create or maintain a leadership position while boosting sustainable economic growth. Greater prioritisation is recommended with the aim to further increase industrial and societal relevance.
- Encourage the transformation of research into innovation by increasing industrial relevance of EU research programmes and strengthening the focus on all stages of the innovation chain (research, development, demonstration and deployment).
- Concentrate resources around fewer co-ordinated efforts.

2. Governance

- Take a holistic approach that brings together in a coherent manner all the Commission Directorates-General concerned.
- Mobilise more resources behind common priorities by increasing the size of individual programmes and improving their focus. Improve responsiveness to market opportunities by enhancing flexibility.
- Reinforce the complementarity of instruments in the EU R&D and innovation landscape, building on the potential offered by the European Research Council (ERC), the Joint Technology Initiatives (JTIs) and the European Institute for Innovation and Technology (EIT).

3. Modalities

- Streamline application and approval processes by reducing the overall administrative burden. This would speed up time-to-contract and encourage greater participation of Small and Medium-Sized Enterprises (SMEs).
- Take a more trust-based approach that is less risk-averse.
- Review Intellectual Property Rights (IPR) provisions governing the knowledge sharing and transfer in collaborative research.

4. Competence base

- Consistently upgrade the quality of education in Europe and boost the understanding of the role of entrepreneurship, innovation and technological progress within a knowledge economy.
- Strengthen the links between education, research and innovation (the knowledge triangle).
- Re-design Europe-wide immigration rules to attract and retain the best talent in Europe.

5. New approaches

- Web-enabled developer communities can make research results available as a basis for further development into a large number of different applications.
- Co-location of company research and university research in a single physical location is one way that can lead to the creation of centres of innovation excellence.
- Public procurement can be a strategic innovation driver. As first customers and early adopters, public sector entities can support the development of pre-commercial prototypes, test them in a live environment and contribute to the perfection and market uptake of their commercial applications.

The challenge:

Making the EU Framework Programme an important component of EU innovation policy

More than ever, the EU faces the challenge of finding new ways to boost its economic growth. As public debt burdens make fiscal stimulus increasingly difficult, economic growth will be the key factor for an exit from the current crisis, and will play an important and long-term role in bringing the EU back to a road of economic and fiscal sustainability.

As a major driver of growth, innovation must play a central role in the EU's economic strategy. The EU's existing approaches to research & development provide a good basis for this, but innovation performance remains below potential. Some important adjustments are needed to give the required boost to innovation activity in Europe.

Companies – large and small – play a crucial role in turning research into innovation by ensuring that Europe's research and development results are applied in ways that stimulate economic growth. The EU R&D Framework Programmes have played an important role in stimulating knowledge creation and innovation in Europe.

The share of company participation in EU Framework Programmes continues, however, to decline despite this important role: the private sector only accounts for about 25% of recipients of EU research funding under the 7th Framework Programme (FP7), even lower than under its predecessor, FP6 (30%). Despite some major strengths of the Framework Programme's architecture and approach, companies face significant difficulties. Amongst other things, complexity, slowness, lack of flexibility, burdensome administrative procedures, and an under-emphasis of applied research and development and demonstration projects with industrial relevance, all reduce the attractiveness to business of participation in the Framework Programme. As a result, FP7's capacity to contribute to innovation is well below potential.

Overall expenditure on R&D in the EU continues to stagnate just below 2% of GDP, missing the target of 3% set in 2002 and now re-iterated in the Europe 2020 Strategy. Total R&D expenditure in the EU has also stayed below that of other major global economies like the US (2.76%), Japan (3.44%) and South Korea (3.21%). China's total share of R&D spending (1.44% of GDP) exceeded the share of 14 EU Member States². These trends must be addressed if innovation is to become a growth driver for the EU.

The future Framework Programme should improve the EU's approach to research & development and innovation from 2014. The European Commission has already proposed some changes to FP7. Many of these proposals, if implemented, will be welcome enhancements to the ongoing Framework Programme. However, the next Framework Programme should include further improvements and be complemented by a more future-oriented EU budget and other complementary policy improvements.

This report outlines business recommendations on the design of the future EU Framework Programme for an improved EU research and innovation performance. It makes recommendations on the orientation of the future Framework Programme, its process and structure, its modalities, the competence base it draws on, and proposes some new approaches.

² EU figures refer to 2008, non-EU figures to 2007 (Eurostat).

The solutions:

Suggestions for a re-designed Framework Programme

1. Orientation

The next Framework Programme should **strengthen the EU's innovation potential**. Greater emphasis must be given to the whole value chain from basic research to innovation, demonstration and market deployment stages. The active participation of companies in this process should be encouraged as a way to strengthen the capacity of EU R&D to drive innovation activity.

World-class research excellence leading to high-quality output is more likely to produce innovation if the research also aims for global industry relevance and impact. The next Framework Programme should aim to **reinforce EU excellence in areas with industry relevance**. Greater goal-orientation and flexibility to adjust to changing circumstances would encourage business participation and lead to world-class research excellence in areas of importance for the European economy.

The **Framework Programme's objectives should focus on the Grand Challenges** as public, private and scientific interests broadly coincide in these areas. However, **greater prioritisation** is recommended, and a **more explicit overall objective of creating sustainable economic growth** would further increase industrial and societal relevance.

To this end, the next Framework Programme should address the Grand Challenges by **mobilising resources from different and new areas**, including making better use of multi-disciplinarity and Public-Private Partnerships (PPPs). **R&D funding should support the entire innovation process**, from the initial stages of development of new technologies all the way through to demonstration projects with an emphasis on rapid commercialisation (deployment).

The next Framework Programme should be **complemented by a reformed EU budget**, putting more emphasis on measures genuinely designed to boost competitiveness and reinforcing Europe's knowledge-based economy – especially the strengthening of R&D and the introduction of innovative infrastructures, technologies and energy sources. This is likely to require the adaptation of existing EU policies in other areas, in particular agriculture and cohesion.

The Framework Programme is implemented in the context of the wider European innovation landscape. In order to be able to stimulate innovation, R&D efforts need to be complemented by reforms in overall innovation conditions in Europe. Completion of the Single Market, ensuring market access, improving the venture capital business and other measures are necessary steps to improve European innovative performance in a sustainable way. To help achieve these outcomes, we recommend that the future Framework Programme should:

- **Prioritise the Grand Challenges that bear the promise of boosting sustainable economic growth** – i.e. be guided by societal demand that opens new opportunities for innovation and business in areas where the EU can create or maintain a leadership position and achieve the objectives of the Europe 2020 Strategy.

Innovation takes place when an idea or invention is transformed successfully into a commercial application.

Throughout the process of research, development, demonstration and deployment, companies have an important contribution to make in ensuring that Europe's research delivers genuine innovations that can be applied globally in ways that stimulate economic growth.

Case Study: Focusing on the Grand Challenges

The European Distributed Energy Partnership (EU-DEEP) project

The EU-DEEP project was set up in 2004 by Gaz de France (today GDF SUEZ) and 7 other energy utilities with a total budget of €30m. It was the largest FP6 project on the Distributed Energy Resources (DER) topic. The overarching goal of EU-DEEP was to design, develop and validate an innovative methodology, based on future energy market requirements, and able to produce innovative business solutions for enhanced DER deployment in Europe

After five years of research involving 42 partners from 16 countries, the EU-DEEP consortium has achieved detailed conditions under which all players will be able to cope with the growing demand for distributed energy resources.

Firstly, the project identified the current "hosting capacity" of the electrical power system and the conditions to increase it at an acceptable cost. Following this, an in-depth economic analysis reveals that DERs can provide significant added value for the electrical system when they comply with network design constraints and contribute, in a reliable way, to better management of peak consumption. Using three aggregation business models extensively tested in the field, the project highlights the most promising directions to take to ensure efficient and sustainable integration of DER in the current electrical power system.

Thus, the results of the EU-DEEP project pave the way for the achievement of the EU's 20-20-20 targets and contribute to enhancing different stakeholders' practices, whilst pinpointing the new areas of knowledge required to achieve progress on DER integration. In particular, it emphasised the role of smart grids for the DER integration in the electrical networks.

- **Increase the focus on all stages of research, development, demonstration and deployment** to encourage the transformation of research into innovation, including the use of Public-Private Partnerships (PPPs) aimed at research, technological development and demonstration and at increased support for risk-taking associated with introducing products to market.
- **Concentrate resources around fewer, coordinated efforts** with a sufficiently large critical mass to significantly impact a small number of priority research areas. The Framework Programme's management capacity should correspond to the number of priority goals, and funding adequacy must be ensured. The principle of subsidiarity, applied in many other areas, may be a useful guiding concept in determining where EU-level research focus can produce most value.

- **Increase industrial relevance of EU research programmes by**
 - o involving business more strongly in a transparent process that deals with priority-setting, evaluation, and the development of calls;
 - o removing constraints that restrict formation of consortia best suited to deliver results, e.g. by making third party participation easier and/or allowing smaller project teams with reduced requirements for regional coverage;
 - o emphasising technological excellence and the potential market impact in the selection of projects with industry relevance;
 - o giving preference to radical and disruptive innovations over mainstream projects.

Case Study: Industrial relevance and result-oriented consortia

Joint European Automotive industry efforts to develop fuel-saving light-weight design

The European automotive industry was tasked to decrease the vehicle weight, and thereby the fuel consumption, as the best way to higher energy efficiency and CO₂ reduction. The European research consortium "SuperLIGHT-Car" (7 Original Equipment Manufacturers, 10 R&D Companies, 10 automotive suppliers, 7 universities, 3 SMEs), including several ERT companies, demonstrated modern lightweight solutions by evaluating all possible materials in an innovative multi-material car body design on an existing mass-produced car.

A multi-material approach was used where each specific body part is made from an efficient application of materials to fulfil the requirements while minimising the weight. The car-body is composed from hot-formed steels, aluminium, magnesium and fibre-reinforced plastics with design and manufacturing technologies appropriate for high-volume series. The final body-in-white concept offers a weight reduction of 100 kg with equivalent performance. Future research based on the findings of "SuperLIGHT Car" is expected to overcome this challenge, while advancing lightweight technologies even further.

The "SuperLIGHT-Car" consortium has overcome all the obstacles to run the project in a highly competitive market and the SLC project results are a significant step towards the production of the sustainable mass-produced light-weight vehicles of tomorrow. It was managed by an industrial project manager. Its size was difficult to manage, but necessary to achieve such a spectacular result. It is an example of a successful industrial project, where competing companies (both material suppliers and customers) have worked together to the advantage of the European automotive industry as a whole.

- **Increase multi-disciplinarity among project participants**, involving more business economists, mathematicians, social and behavioural scientists, designers and artists.
- **Pursue greater international cooperation** by actively working towards ensuring **non-discriminatory access for EU companies and researchers to third countries' research programmes**.
- **Take into account the needs of emerging economies** in the development of call objectives to better enable EU companies to develop future growth markets. To this end, the inclusion of staff and project partners from third countries should be facilitated. This will also favour the development of solutions to the global Grand Challenges.

Case Study: EU-China cooperation on Carbon Capture and Storage

FP6/COACH Cooperation project between China and Europe on Carbon Capture Storage (CCS)

The Memorandum of Understanding signed in 2005 between EU and China (NZEC: Near Zero Emissions Coal), initiated the COACH project by gathering 12 European and 8 Chinese partners (industrial and academic), including numerous ERT companies.

COACH studied the feasibility of CO₂ capture and storage on coal gasification plants (IGCC) in China. The project's main objectives were not only to provide a techno-economic analysis, but to prepare the ground for further cooperation and a potential CCS demonstration plant in China.

Knowledge sharing training sessions and workshops were organised to facilitate technical exchange and build a common vision on CCS. Even though this potential collaboration has been slowed down due to confidentiality reasons, the COACH project has initiated an important collaboration between Chinese and European industrial partners and universities. It also provided participating companies with a better understanding of the Chinese energy market.

2. Governance

To achieve the proposed orientation, the future Framework Programme should be embedded in a more flexible governance model that reinforces the **coherence and consistency of all R&D and innovation programmes in the EU**. The future Framework Programme should rely on a streamlined governance structure that aims to achieve greater synergies between the different public sources of R&D funding at EU, national and regional levels by favouring cooperation across administrative structures at the various levels.

The coherence of the EU's R&D and innovation framework, as well as the complementarity between EU, national and regional funding programmes should be reinforced. To this end, **the European Research Area (ERA) should be strengthened further by ensuring the coordination of national research initiatives**, e.g. by means of joint programming of national research programmes, possibly even where no Framework Programme funding is involved.

Coherence and cooperation could be further strengthened if there was **greater harmonisation and synchronisation of national funding**, which would increase the synergies between R&D efforts within the EU. One approach to this could be to make use of enhanced cooperation in this area, e.g. establishing a joint coordination platform among those Member States committing national funding for joint programming. Common awarding criteria, and evaluation rules should be agreed, and timing of calls for proposals and funding decisions coordinated, if necessary with facilitation from the European Commission. The synergy and cooperation between the EU Framework programme and the EUREKA initiative should be strengthened.

The **future Framework Programme should fit neatly into this overall architecture of coordinated funding programmes**, targeting EU funding primarily at areas where EU-level research collaboration can add genuine value and is complementary to other research activities at all levels.

In addition to such improved coherence of the overall R&D and innovation framework in the EU, **consistency across the individual parts of the future Framework Programme** should also be ensured. To this end, the current structure and processes should be reviewed.

We propose that the future Framework Programme should have the following characteristics:

- It should take a **holistic approach** which is multi-disciplinary, consumer-oriented, accepted by society and brings together all the Commission Directorates-General concerned in a coherent manner. It should always be investigated whether planning and implementation of strategically important elements of the Framework Programme, in particular those where critical mass is essential, could be carried out by a Public-Private Partnership.

- The individual **Specific Programmes** should be **larger in size** and **more focused in substance** to favour mobilisation of more resources behind common priority missions, especially in areas where industry relevance is ensured. This may mean reducing the number of programmes under the Framework Programme.

Case Study: Ultra-Low CO₂ steelmaking process to optimise the energy and the CO₂ capture

FP6/ULCOS Project

The ULCOS (Ultra Low CO₂ Steelmaking) programme was launched in 2004. Its objective was to identify and develop solutions for making steel with a reduction of CO₂ emissions of more than 50% compared to what is achieved by the best performers today. Steelmakers had already made a lot of efforts to reduce the CO₂ emissions within the last 15 years, particularly by increasing the efficiency of their processes. Steelmaking processes now are considered mature, operating in the case of blast furnace at 95% of their theoretical efficiency. Thus, the carbon input is as low as it can be without significant changes. To achieve further CO₂ reductions, breakthrough solutions based on new processes had to be imagined and developed.

Following extensive research studies, the programme approach was well validated after 5 years.

ULCOS involves 48 organisations and more than 120 people covering a number of partners: EU steelmakers, industries representing the steel value chain, and major universities. Air Liquide was an active partner contributing to the development of a very promising route – the “Top Gas Recycling Blast Furnace” – by providing technology to capture the CO₂ from the blast furnace gas.

ULCOS offered the opportunity to demonstrate capabilities in conceiving, developing and operating a CO₂ capture pilot project.

- Under each programme, individual projects should have **more flexibility to adapt to market developments**, thus retaining their relevance. Research projects should enjoy greater flexibility in the pursuit of their top-level key performance indicators (KPIs) by allowing project work plans to be adapted to market developments. It should also be possible to easily implement smaller projects focused on individual R&D stages or with a limited number of partners.
- Some resources should be specifically assigned to **short-term projects focusing on technology**, research and innovation challenges that can be implemented swiftly as market opportunities emerge.
- Business expert participation in the **evaluation process** should ensure greater industry relevance. This could best be achieved through practical improvements to the process, e.g. the use of online evaluation tools. This would make it easier for industry to commit its experts to this process.

- The complementarity of instruments in the EU R&D and innovation landscape should be reinforced under the future Framework Programme. In particular:
 - The **European Research Council (ERC)** has been a driver of research excellence. It should continue to pursue this objective. Industry involvement and participation should increasingly be promoted to reinforce EU excellence in areas with industry relevance by nurturing science-based industry research and creating greater impetus for the establishment of research spin-offs. As this would be a step towards reinforcing the EU's innovation capacity, a moderate increase in the ERC's budget is needed. It would also make sense to replicate national approaches that ensure funding for proposals that meet the ERC's quality criteria but cannot receive direct ERC funding due to budgetary constraints, following the example of France, Italy, Spain, Sweden, Hungary, Norway and Flanders.
 - **Eureka clusters** (such as ITEA 2 and Celtic) are good examples of industry driven collaboration with an appropriate funding scheme.
 - The **Joint Technology Initiatives (JTIs)** can play an important role in the innovation process as demonstration programmes. They bear great potential for triggering competitive innovations in Europe, however their governance structure needs to be better balanced and their regulatory regime eased to suit public-private partnerships (PPPs). The establishment of JTIs should become easier and quicker, and their flexibility should be improved by allowing more independent governance structures. Furthermore, it is important that the level of funding industry is allowed to receive for research, technological development, and pilot and demonstration projects under the JTIs is increased to the same level as under the Framework Programme.
 - It is too early to make a definite judgment on the role of the **European Institute for Innovation and Technology (EIT)**. As a result, it should – for the time being – be kept separate from the future Framework Programme. It could, however, play an important role in attracting more venture capital funding to R&D and innovation in the EU. If this objective is not clearly attained, its role within the EU's R&D and innovation landscape should be reassessed to avoid an overly complex scenario. Once more experience has been gained with the EIT, its impact should be assessed. In the meantime, the KICs should continue to be eligible for Framework Programme funding as consortia. Processes and regulations should, however, be more clearly elaborated as soon as possible.

Case Study: Increasing industrial relevance and reinforcing complementarity between EU and national research programmes

European Technology Platform 'Food for Life'

The European Technology Platform (ETP) 'Food for Life' was created in 2005 under the auspices of the Confederation of the Food and Drink Industries in the EU (CIAA). The main goals of the ETP are to strengthen the European innovation process, improve knowledge transfer and stimulate European competitiveness across the food chain.

Following the publication of the ETP's "Vision for 2020 and beyond", and the "Strategic Research Agenda (SRA) 2007 – 2020", an "Implementation Action Plan" (IAP) was then published in 2007.

The IAP explains how the research priorities that were identified in the SRA of the ETP Food for Life can be implemented most effectively by focusing on three main research areas:

- Improving health, well-being and longevity
- Building consumer trust in the food chain
- Supporting sustainable and ethical production

The ETP's achievements have already had a major impact by bringing together a wide cross-section of the European research community and other stakeholders to identify the most important challenges the sector faces in the next decade, and by establishing an active network of 35 National Technology Platforms, each with the same national stakeholders and a similar research agenda.

Networks like this will be instrumental in influencing the priorities for research within calls for proposals under the Framework Programmes and will form the basis for ERA type programmes.

3. Modalities

Industry participation in the future Framework Programme can be boosted by reviewing some of the modalities applied under FP7. Companies struggle with the high level of complexity of the existing R&D and innovation landscape, as described above. In addition, they encounter a high level of complexity at all stages of the FP7 process: multiplicity of calls and information sources, onerous applications for funding, cumbersome contract negotiations governed by different sets of rules, burdensome administration and reporting requirements, oversized consortia, and programme fragmentation. The EU's innovation capacity can be strengthened by addressing these multiple levels of complexity in ways that will encourage greater industry involvement. Many proposals have already been made in this area. We would specifically highlight the following:

- **Streamline application and approval processes**, so that a project can start at the latest six months after the submission deadline. To that end, **reduce the overall administrative burden**, especially by simplifying application and reporting processes as follows:
 - o Apply **more flexibility in cost accounting and reporting**. Beneficiaries should be able to use standard reporting practices (e.g. approved national reporting practices) or company accounting rules accepted by external auditors. Reporting requirements should be less detailed (allowing, for example, the use of standard salary levels), leave more flexibility in choosing the most appropriate cost model, and their timing be based on achievement of milestones rather than fixed dates.

Case Study: Simplified financial reporting

Methodology certification to simplify financial reporting

One positive corporate experience during FP7 was the introduction of Certification on Methodology. The objective of this certification is to promote the use by beneficiaries of correct and compliant methodologies when calculating personnel and indirect costs to satisfy FP7 financial reporting requirements.

The Financial Guidelines governing FP7 usually cover high-level rules and regulations but do not provide detailed description of specific situations. This leaves room for interpretation, and thus presents challenges for multinational companies whose research centres are dispersed around the globe under different entities but all contributing to FP projects.

For many corporate contributors to research through the Framework Programme, Financial Guidelines subject to interpretation presented a high risk. Every audit certification and audit by the Commission was a long process and cause for debate on the interpretation of the methodology.

To streamline this process, in 2009 SAP proposed to the European Commission the issuance of a Certificate on Methodology to identify the rationale and accounting practices to calculate direct personnel and indirect (overhead) costs based on the company's global organisational, legal and financial infrastructure. The Commission approved the methodology in 2010, confirming compliance with the FP7 Financial Guidelines.

The approved methodology is valid for all subsequent financial statements submitted by SAP under FP7. The final certificate on financial statements will be prepared by the auditors by simply verifying the eligibility of personnel and indirect costs and compliance with the declared methodology, thus adding significant simplification to the audit work and reducing administrative overheads both for beneficiaries and the Commission.

- **Streamline official documentation.** The clarity of rules can be increased, and room for interpretation reduced, by reducing the number and size of official documents. This could in part be achieved by harmonising the rules governing the various instruments of the R&D and innovation landscape, and by reducing the number of funding instruments available.
- **Improve coherence in the implementation of rules and principles** governing the different instruments (especially across different Directorates-General) and reduce the discretionary interpretation of project officers' negotiating mandates.
- Take a more **trust-based approach that is less risk-averse.** The threat of personal financial liability of Commission civil servants leads to an excessively risk-averse approach. Yet innovation implies a certain degree of risk-taking. Risk-taking should also be supported by ensuring that project partners will not be required to return funding under the future Framework Programme once it has been awarded and approved.
- Continue to **ensure budget clarity** through a clear division of the annual budget for each thematic priority and for each call. The time for payments after the submission of project reports should be shortened (this could be supported by streamlined reporting requirements).
- **Apply Single Market principles** to the Framework Programme, notably allowing companies to specify the group/parent in addition to the participating national subsidiaries, or, if they so wish, to participate as one legal entity at EU level. Under FP7, each national subsidiary must apply under an individual administrative number. Under the future Framework Programme, all instruments and all Directorates-General should allow EU subsidiaries to also specify their group/parent, or even apply under one overall company number if they so choose. This would leave companies with the possibility to choose the most appropriate option on a case-by-case basis.

- Improve attractiveness for the participation of **Small and Medium-Sized Enterprises (SMEs)** – who can be major drivers of innovation – by re-introducing the concept of 'Associated Partners' (used previously under the 5th Framework Programme). Complexity of rules, as described above, and uncertainty regarding the award of grants are major obstacles to SME participation.
- Increased market-orientation of the future Framework Programme will require a **review of Intellectual Property Rights (IPR) provisions** governing the knowledge transfer in collaborative research. In general, IPR provisions should remain flexible, and aim to ensure predictability. For global companies, the treatment of subsidiaries in third countries is an important issue. These subsidiaries should not be treated as third parties. Rules regarding IPR ownership and access rights should be subject to contractual freedom between the participating entities.

Case Study: Responsible Partnering Handbook

Guidelines for Collaborative Research and Knowledge Transfer between Science and Industry

Responsible Partnering is a voluntary code of conduct for innovative companies and public research institutions to enable them to collaborate more effectively, and at the same time contribute to the achievement of their respective missions in a sustainable way. It is fully consistent with the new paradigm of Open Innovation.

The Responsible Partnering guidelines have been developed by experienced practitioners of collaborative research from four European associations representing the needs of Industry (EIRMA), Research & Technology Organisations (EARTO), Universities (EUA) and Knowledge Transfer Organisations (ProTon Europe). The Handbook, first released in 2005, is based on the analysis of the main problems preventing effective collaboration and on the success stories where such collaboration was effectively achieved.

Responsible Partnering is both a change of mindset and a practical set of tools. Concerning the mindset, the handbook specifies a number of principles and policies to be adhered to by project partners to facilitate the development of more effective collaboration on the basis of mutual trust. On the practical side, the Handbook contains actionable recommendations on such issues as identifying good partners, constructing the Collaborative Research Agreement and self assessment guidelines. In the 2009 update, information on State aid aspects and a checklist for situations involving the supervision and training of PhD candidates were added and the section on human aspects of effective collaborative research extended.

4. Competence base

Europe's innovation potential crucially depends on the use of its most precious resource – its people. As talents drive research excellence, the EU's innovation potential can be increased by putting greater focus on the fostering of a world class talent base through education and international openness. The European Research Council (ERC) and the European Institute for Innovation and Technology (EIT) – both addressed in section 2 – can make important contributions in this area.

Far-reaching improvements are possible. An open mindset within society favouring research progress and entrepreneurship is a fundamental requirement. *ERT's Vision for a competitive Europe in 2025*³ argues that an increased international reputation of European universities would encourage business to invest in ambitious research and innovation programmes and help attract venture capital.

This illustrates that Europe's innovation potential depends on many additional factors. Therefore, the next **Framework Programme should be accompanied by measures** addressing Europe's talent base, for example:

- **Consistently upgrade the quality of education in Europe.** The European education system should support the building of a solid understanding of the role of entrepreneurship, innovation and technological progress within a knowledge economy. All actors in the field of education, including EU institutions, Member States and regional administrations, must closely coordinate their actions to bring their educational systems in line with the European innovation agenda.
- **Strengthen the links between education, research and innovation (the knowledge triangle).** More effective interaction between education and business is needed across Europe, in particular to enhance the necessary interest in mathematics, science and technology. An identification of best practice needs to be conducted in a systematic way and then spread within the EU. To this end, ERT supports the ongoing process of the creation of a European Coordinating Body.
- **Develop life-long learning opportunities** by transforming education systems to better enable working adults to pursue part-time education in parallel to their job. Work with companies to integrate continuing education and long-term commitments towards the educational sector into their business models.
- **Re-introduce Industry Host Fellowships** used under the 5th Framework Programme. These 'Marie Curie' Fellowships are useful tools to give young researchers – particularly those without previous research experience in business – the opportunity to receive international industrial research training in companies.
- **Create fully integrated European professional schools and universities** dedicated to a specific research theme. Each such school could be based in one single location to speed up knowledge dissemination.
- **Encourage European universities to develop campuses and partnerships in other parts of the world,** teaching and recruiting top international talent.
- **Re-design Europe-wide immigration rules to attract and retain the best talent in Europe.** Immigration rules should be based on the principles of openness, clarity and predictability, creating a meaningful incentive for non-native high performers to contribute to a European culture of excellence. Obstacles to the free movement of highly-skilled third-country nationals within the EU must be eliminated, especially between EU-based universities and between EU-based industrial R&D activities.

³ Available at www.europeontrack.eu

5. New approaches

The innovation process in itself continues to undergo innovation. New approaches are tried constantly. Some of them develop into great successes and, if mainstreamed into the EU innovation landscape, bear the promise of significantly increasing the EU's innovation potential.

The future Framework Programme should make greater use of new models of productive R&D and innovation platforms. It should be flexible in allowing for the testing of new approaches and broadening their use in case of success. A number of new approaches have already been proven to produce good results in different settings, and their more widespread use should be encouraged where appropriate:

- **Web-enabled developer communities** are being successfully used in several industry sectors. In all cases, knowledge, which may be patent protected, is made available to open developer communities on the internet (directly or through technology brokers) as a basis for further research. In this way, research results can be used as a basis for further development into a large number of different applications. The potential of this approach in areas related to the Grand Challenges is particularly promising, as joint involvement of the public and private sectors would increase the likelihood of producing results that could then be applied across the entire EU.

Case Study: Web-enabled developer communities

Forum Nokia: an open innovation platform

For more than 10 years, Forum Nokia has helped developers and innovators all around the world to create application and service innovations and add value to industry and the consumers. Forum Nokia enables creative professionals and application developers to get their innovations to market place quickly and efficiently, by delivering resources covering the entire mobile application lifecycle, from development to sales. The developers can download the essential software from the Forum Nokia website and create their innovations on the top of this software. As a global player Nokia can ensure that the developers can bring their innovations quickly and effectively to the global market place - over 180 countries and 30 different languages. The best innovations from Forum Nokia are rewarded by an innovation prize.

Forum Nokia delivers resources to more than 4 million registered developers and receives more than 1.5 million unique visitors per month. For application and web developers this includes key mobile operating systems and programming tools such as MeeGo, Symbian, Java, Python, Flash, and Web technologies. Content developers working with images, video, audio, themes, SMS, MMS, and the Web are also supported.

Forum Nokia members come from around the world. The EU is the largest region with over 30% of the developers coming from Western Europe. All other regions are represented: Africa (2.7%), Asia (17.5%), Australia (2.4%), China (9%), Eastern Europe (14.8%), India (7.2%), North America (9.8%) and South America (6.2%).

Experience with Forum Nokia shows that to an increasing extent, for innovations originating from outside the traditional product space and moving towards services, solutions and intelligent combinations of products and services, this kind of open, web-enabled developer platform can support large innovator communities in an effective and cost-efficient way.

- **Co-location of company research and university research in a single physical location** can lead to the creation of centres of innovation excellence, where open innovation collaboration is successfully used in specific research areas. The future Framework Programme should be favourable towards funding projects taking this approach.

Case Study: Co-location of company and university research

High Tech Campus Eindhoven

High Tech Campus Eindhoven is an R&D ecosystem of more than 90 companies and institutes, and more than 8,000 researchers, developers and entrepreneurs, who together are working on developing the technologies and products of tomorrow. The preferred work approach at the campus is Open Innovation: campus companies share knowledge, skills and R&D facilities (such as laboratories, cleanrooms and equipment) in order to achieve faster, better and more customer-oriented innovation.

The driving force behind the establishment of High Tech Campus Eindhoven was Philips. In 1998 the company established the Philips High Tech Campus to act as a single location for all its national R&D activities. This approach proved highly successful. To further accelerate this process, Philips decided in 2003 to open up the campus to other technological companies. The result was a massive growth with numerous innovative companies – both large and small – keen to become part of this R&D hotspot.

The companies on the campus focus on high tech systems, microsystems, embedded systems, life sciences and infotainment. Taking these domains as their starting point, they create global innovations, most notably in the application fields health, experience and energy. The campus is located at the heart of Europe's leading R&D region. The Eindhoven, Louvain, Aachen triangle (ELAt) occupies a leading European position in micro-electronics, nano-electronics and life sciences. Together, the researchers in the Province of Noord-Brabant area boast Europe's second-highest number of patent applications per capita.

The international community of High Tech Campus Eindhoven shares a common drive for creating innovative solutions that make human life healthier, more pleasant, easier, more interesting and which contribute to a sustainable world. The campus is a place where entrepreneurial spirit, high-end research and creativity can flourish and lead to successful new products for global business.

- **Make public procurement a strategic innovation driver.** As first customers and early adopters, public sector entities can support the development of pre-commercial prototypes, test them in a live environment and contribute to the perfection and market uptake of their commercial applications. As a significant source of demand in the EU, public procurement can thus drive the development and implementation of new technologies, including through public-private partnerships (PPPs). Public procurement should be the channel through which the public sector leads by example, ensuring that the highest standards and latest technologies are used in public projects. However, this type of public procurement should be funded separately from the future Framework Programme.

Case Study: Public procurement as driver of eHealth innovations

TalkingEyes

TalkingEyes is an innovative health screening and management programme for people aged 30 years and above. Its aim is to identify citizens with a raised vascular risk, empower them through prevention to manage their own health and enrol them in health management schemes. It is based on the result of a European Framework Research project.

A core element of TalkingEyes is a rating of the participants' vascular risk based on a qualitative and quantitative analysis of the small vessels of the eye background. Mobile screening units acquire images using a non-mydratic fundus-camera – a quick, safe and painless procedure for the participant. Image data and the participant's responses to a risk profile questionnaire are then digitally transferred to a central reading centre for interpretation. Medical experts supported by computerised quantitative and qualitative algorithms evaluate the data resulting in an index rating of the vascular risk. The result is communicated electronically to the participant and referring physician.

The Scottish NHS (National Health Service) decided to implement this screening for all patients as an efficient process. This allows the ophthalmologists to see only those patients requiring treatment. The process was implemented by Siemens and resulted in 300,000 patients examined annually at 73 locations. The images are reported and quality assured in five regional centres. The implementation of the nationwide screening processes was completed by the end of 2006. The Scottish Ministry of Health expected not only to do away with the waiting lists, but to reduce costs based on economies of scale.

Case Study: Public Private Partnerships

Smart Santander

This project has a modest budget of €8.6m, with the objective of providing a European experimental test facility for the research and experimentation of architectures, key enabling technologies, services and applications for the Internet of Things (IoT).

This project is one of the initial steps towards the development of the Smart City concept where ICT service platforms, sensors, IoT and other elements are combined to form an ecosystem of interrelated applications. These applications will be provided by telecoms operators, utilities, municipalities and other companies with the objective of providing a complete set of applications and services.

The Smart City is a good example of how the combined effort of users (utility providers, local authorities and citizens) and ICT and information providers can work together to develop a market that could be valued at more than €200bn in the next 10 years.

This idea has been taken on by the EU's 'Future Internet' Public-Private Partnership (PPP). This initiative is composed of several interrelated projects, together forming a coherent effort aiming aim to make public service infrastructures and business processes smarter (i.e. more intelligent, more efficient, more sustainable) through tighter integration with Internet networking and computing capabilities.

- **Test the use of small two-party projects, short projects and two-step projects.** Such projects could, for example, be characterised by an accelerated funding application and feasibility phase, followed by a longer research phase, and possibly cover multiple industry sectors at once.
- **Improve synergies between Structural Funds and the Framework Programme.** Structural Funds can be used more to stimulate regional R&D activity and public procurement of new technologies and R&D from the private sector. The capacity of recipient countries to draw on Structural Funds for R&D purposes should be improved.
- **Introduce new ways of working.** Addressing the Grand Challenges will require a multidisciplinary approach including design, art, the humanities and social sciences, with greater use of test beds and claim validation.

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