# Interim Evaluation of the Seventh Framework Programme

## *Report of the Expert Group*

**Final Report 12 November 2010**

We, the undersigned, the Expert Group on the *Interim Evaluation of the Seventh Framework Programme*, are pleased to present our report to the European Commission

**Rolf Annerberg**
***Chairman of the Expert Group***
Director General – Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), Stockholm

**Iain Begg**
***Rapporteur***
Professorial Research Fellow – European Institute, The London School of Economics and Political Science, London

**Helena Acheson**
Senior Consultant - Technopolis Group, Frankfurt
Former Head of Division – Enterprise & Regional Policy, Forfas, Dublin

**Susana Borrás**
Professor with special responsibilities – International Centre for Business and Politics Copenhagen Business School, Frederiksberg

**Arvid Hallén**
Director General – The Research Council of Norway, Oslo

**Toivo Maimets**
Professor of Cell Biology and Director - Institute of Molecular and Cell Biology, University of Tartu
Chairman – Estonian Science Foundation, Tallinn

**Riitta Mustonen**
Vice-President (Research) – Academy of Finland, Helsinki

**Hartmut Raffler**
Former Head of Division – Information and Communications, Siemens Corporate Technology, Munich
Honorary Professor – Technical University Munich

**Jean-Pierre Swings**
Honorary Professor – Space Astrophysics – University of Liège

**Kristiina Ylihonko**
CEO – Galilaeus Oy, Kaarina
Visiting Professor - University of Turku

# Interim Evaluation of the Seventh Framework Programme
## *Report of the Expert Group*

Contents

## *Foreword*

The Seventh Framework Programme for Research and Technological Development (FP7) is the biggest ever investment made by the EU in assuring its future as a knowledge-based society. It builds on the successes and experience of previous FPs that have grown in ambition over the years. FP7 has a budget of some €50 billion over the seven years from 2007-2013,, constituting an annual average investment that is substantially higher than in previous Framework Programmes and that will, by the end of the period rise, to around 10% of the public spending on research by Member States.

This interim evaluation of FP7 has been carried out by an independent Expert Group, appointed by DG RTD in the spring of 2010 in line with article 7(2) of the EC Seventh Framework Programme Decision which provides that: '*No later than 2010, the Commission shall carry out, with the assistance of independent experts, an evidence-based interim evaluation of this Framework Programme and its specific programmes building upon the ex post evaluation of the Sixth Framework Programme.*'[1]

The Expert Group wishes to express its sincere gratitude to several people, who have contributed to this report. We wish to acknowledge the work of the supporting experts: Professor Costas Fotakis, Professor Annamária Inzelt, Professor Jean-Louis Coatrieux, Dr. Jonathan Adams and Dr. Wolfgang Polt. The Expert Group's work has been ably assisted by the Commission staff, especially DG RTD A.3 unit Evaluation and Monitoring of Programmes (Dr Peter Fisch, Dr. Neville Reeve, Ms Grainne Freir, Ms Justyna Tisserand, Ms Eszter Batta, Ms Isabelle Dupont, Dr Gerburg Larsen and Mr Georgios Chorafakis), and we have also benefited from the input and co-operation of many other officials responsible for different parts of the Framework Programme.

The evaluation comes at a point when the Framework Programme has reached its mid-point in calendar terms, but when many of the projects funded in its early years are still in progress and when the bulk of the money remains to be allocated. Some of the projects initiated in the latter years of FP7 can be expected to continue for as long as five years after its formal end, that is up to 2017-2018. It follows that only tentative conclusions can be reached about the outcomes of FP7 and the impact it will have on Europe's science, its economy and its society.

Nevertheless, an interim evaluation has a vital role to play in taking stock, in putting forward proposals for the remaining years of FP7 and in drawing out lessons that can feed into the planning – already in its early stages – of a successor programme.

Stockholm, Brussels, 12 November 2010.

For the Expert Group, Rolf Annerberg

[1] OJ L 412, 30.12.2006, P. 001.

## Summary

1. Achieving a substantial enhancement of research is one of the key policy aims of the European Union and the Seventh Framework Programme (FP7), with an indicative budget of some €50 billion over the period 2007-2013, constitutes an important investment in furthering that aim.

2. This interim evaluation has been conducted as the Programme reaches its half way point in time elapsed, although before more than half the money has been spent and at a time when only preliminary information about its outputs and impact is available. It has looked, in general, at whether the Programme is fulfilling its ambitions and, in detail, at a variety of facets of its implementation, in order to arrive at recommendations for its development in its latter years. Some of the lessons that can be drawn from this evaluation can also be expected to inform the elaboration of subsequent EU research programmes and policies.

3. A first key message is that FP7 is on course and is clearly making a significant contribution to European science and the development of the European Research Area. There are acknowledged difficulties in some aspects of its implementation, but it is important to applaud what is good about it.

### S1 Key Strengths

4. The data from the latest annual monitoring report on FP7 shows its breadth and scope. Whether judged by the number of researchers involved in cooperative projects, the geographical spread of teams or the range of topics covered, the Framework Programme has a vast and impressive reach. The Expert Group concludes that it is making a difference, that there is a very high likelihood of positive impacts and that it is contributing to the development of the European Research Area.

5. The Expert Group finds that the principle of excellence in project selection is largely achieved. In much of the *Cooperation* Programme to which nearly two-thirds of FP7 funding is allocated, leading researchers are being funded, the quality of proposals is generally assessed to be high and there is robust competition for funding. Despite being a new, and thus untried, instrument, the European Research Council (ERC) has manifestly succeeded in attracting and funding world-class research and is playing an important role in anchoring research talent.

6. Mobility and training of researchers continues to be underpinned by the 'Marie Curie actions' under the specific programme *People* and is making a valuable contribution to the development of the human capital of researchers. However, the low success rates in some of the Marie Curie actions suggest that some rebalancing of resources within the specific programme could enhance its impact.

7. FP7 is also having a positive effect on research infrastructures, raising questions of whether more emphasis should be given in future to this element of the programme. Another novel measure, the Risk Sharing Finance Facility (RSFF), has been evaluated positively and can be seen as a promising means of adding to the resources for investment in infrastructure by complementing grants with loans.

8. At a procedural level, it is worth noting that calls have been developed and processed effectively and that these procedures have ensured that funds are allocated in a reasonably timely manner and with integrity.

9. There is some evidence that successive FPs, and FP7 in particular, are having a positive 'leverage' effect in promoting national research efforts and reinforcing the research and innovative capacity of industry.

## S2 Areas in need of improvement

10. The complaints that the Expert Group has read and heard about the administrative burdens of involvement in FP7, despite the many worthwhile changes adopted since FP6 under the banner of simplification, testify to the continuing frustration in this regard. Too many procedures continue to be unwieldy or disproportionate to the very marginal benefits they provide in terms of control of public spending, and there is strong evidence of a lack of flexibility. The Expert Group concludes that while many of the specific developments are welcome, a much more radical approach is now needed to attain a quantum leap in simplification. In particular, the risk-trust balance needs to be redressed, as the current risk-averse culture inhibits participation and may be undermining the research most likely to result in genuine breakthroughs.

11. The goal of boosting female participation has made some progress, but the 'glass ceiling' alluded to in the final evaluation of FP6 still seems to be intact. Nevertheless, FP7 has contributed to boosting women's presence in scientific research, even if the goal of 40% participation is some way from being met. Behind the data on participation rates lies the fact that women comprise only some 30% of the research base in the Member States. This means that the target will be very difficult to reach and highlights the need for initiatives at Member State level to increase female participation in research. Women are also under-represented in certain disciplines and at the most senior levels. As younger cohorts of researchers move through the system, this should gradually improve, but should be monitored.

12. It is unclear whether industry participation has reversed the decline seen in previous FPs, but the funding going to SMEs is now close to the target level of 15% for the *Cooperation* specific programme. There is, however, still a wide range of evidence that small businesses are more easily deterred by 'complexity' in procedures and delays in contracts.

## S3 New concerns and dilemmas

13. Considerable effort is needed to achieve effective coordination of research between the Member State and EU levels. Given that the ERA is supposed to bring out the best of both, it is worrying that such difficulties seem to be so hard to resolve and that it is so difficult to create a common pot of funding when needed. Further development of the Joint Programming Initiative will make it imperative to find effective solutions to this issue.

14. Among the novel measures, the Joint Technology Initiatives (JTIs) are developing, but have been the subject of complaints about inconsistency in legal structures and procedures that are off-putting to industry, universities and research organisations. In addition, overhead rates are considered by many actors to be too low to cover the costs of participants.

15. The evidence on Article 185 and on ERA-NET Plus is slender, although evaluations of the progress to date offer some encouragement that these new instruments can help to improve coordination between EU and national research.

16. Success rates in many areas are relatively low and imply a substantial waste of research resources in failed applications that are deemed worthy of funding but miss the cut-off

threshold. At the same time, the success rates reflect the high standing of the Programme and its strong appeal to researchers. Some national systems have responded to this phenomenon by offering complementary funding. Nevertheless, a question arises about whether the call procedures could be improved to lessen the waste, perhaps by more resort to two-stage calls.

17. Success rates for applicants located in several of the Member States that acceded to the EU in 2004 and 2007 are distinctly lower than for the EU15, although relatively low success rates are also found for some of the southern Member States. Having 'scientific excellence' as the principal criterion for research funding will inevitably see some concentration of research funding in favoured locations. But a possible corollary is that the FP, in conjunction with other EU instruments (such as the Structural and Cohesion Funds), should do more to foster capacity building in these areas.

18. The average amount of time needed from the end of a call to the signing of a research grant is nearly a year, which is high and undoubtedly offers room for improvement, but not grossly out of line with national practice. However, of more concern is diversity in time to grant (TTG) across different components of FP7. The conclusion drawn by the Expert Group is that this ought to be amenable to changes in practice in the Commission or the executive agencies, and that the areas currently exhibiting overly high TTG should be expected to converge on the best performers.

19. There is also evidence of a lack of clarity in how innovation as opposed to 'pure' research is incorporated in the FP, and how to assure coherence between research aims, the 'Innovation Union' dimension of Europe 2020 and the economic development advanced by the EU's Cohesion policy.

20. Further questions arise about how to ensure that the undoubted achievements of science are translated into impacts – whether economic or social - that benefit society at large. Although the Expert Group is encouraged by the attention given to dissemination, it is far too soon to attempt any comprehensive assessment of the outcomes of impact of research which is still in progress from the very first calls of FP7.

## S4 Directions for reform

21. While it is important to retain stability in much of the FP and to avoid disruptive changes to procedures with which the research community has become familiar, there can sometimes be good reasons to change tack. From the perspective of EU policy, one such is the growing recognition that the research effort should increasingly be focused on the 'Grand Challenges' – including *inter alia* climate change, competitiveness, an ageing population, energy supply – that confront Europeans.

22. At the same time, the need to establish stronger and better connections between research, innovation and education has to be addressed (the Knowledge Triangle). Special attention has to be paid to research training and education. The implication is that some strategic shifts in the focus of FP7 are warranted between 2011 and 2013, paving the way for bigger shifts in FP8.

23. In addition, the integration of research policies at national and EU levels, whether in connection with the ERA or the 'Innovation Union' aspects of Europe 2020, requires new thinking. As joined-up policies (including those relying on the open method of coordination) become joined-up actions through Joint Programming, the Expert Group considers that it is too early to judge whether the potential that this represents in terms of efficiencies and developing critical mass to address grand societal challenges is currently

being optimised. There is also a need to look afresh at the international dimension of the FP, both to boost Europe's standing in global science and to take advantage of the opportunities afforded by international collaborative research.

24. Similarly, the Expert Group concludes that the connections between the main performers of research in universities and research and technology organisations (RTOs), on the one side, and industry (especially SMEs), on the other, are not working as well as they could do. In fostering innovation, the role of industry as the bridge between research and 'commercialisation' has to be stressed and the fact that SMEs are consumers as well as performers of research better recognised.

## Ten recommendations

There has been considerable 'learning-by-doing' in the implementation of FP7, notably in developing the new instruments and establishing the executive agencies. However, the Expert Group has identified a number of areas where changes capable of improving the effectiveness and impact of the Framework Programme in its latter years could be made. Many of these involve making decisive choices and the exercise of effective management, and the Group calls for them to be adopted rapidly. Bearing in mind that the timetable for development of a successor programme to FP7 is being accelerated and that the Europe 2020 strategy is developing its own momentum, not least with the publication of the Communication on the Innovation Union, lessons from the first half of FP7 are highly relevant. The Expert Group, therefore, also puts forward recommendations for FP8.

Here, the ten key recommendations of the Group are presented. In addition, many more specific issues that warrant attention are raised at different points in the report.

1. **To advance ERA and Innovation Union objectives, integrating the research base** by overcoming fragmentation in research is vital, while simultaneously achieving a sharper division of labour between what is done at EU level and what is undertaken in national programmes. European research and innovation efforts must concentrate on themes where critical mass is vital for success and where breakthroughs require cross-border solutions, while also allocating sufficient resources to R&D topics which promise radical innovations. Addressing the 'Grand Challenges' confronting the European Union should increasingly be at the heart of EU research policy, starting in the last three years of FP7, but more emphatically so in a successor programme. This process could be structured according to who sets the research agenda and to take account of the 'smart, sustainable, inclusive' *leitmotif* for Europe 2020, although they will need to work together to address the 'Grand Challenges' as follows:

    - Science for science - the researchers set the agenda
    - Science for competitiveness - industry sets the agenda
    - Science for society - civil society actors set the agenda

2. **To develop and implement high quality research infrastructures**. Research infrastructures (RIs) are pivotal for the Knowledge Triangle, and as such are a pillar for implementing the ERA, but there needs to be coherence between what is funded by FP7 under the heading of *Capacities*, the ESFRI and capacity building undertaken as part of Cohesion policy and what is being considered in the context of Joint Programming. More effort should be made to boost RIs during the latter stages of FP7, especially the Integrated Infrastructure Initiatives (I3) that have the greatest scope for added value at European level. In addition there should be a focus on promoting their impact by

establishing synergies between training instruments and utilisation of RIs and by stimulating industrial and third country access.

3. **The level of funding should, at least, be maintained.** Although the straitened budgetary conditions following the severe economic crisis will mean tough choices have to be made in public spending, the competitive challenges that the EU faces require sufficient investment in long-term economic development and there should be no reduction in funding for FP7 in its latter stages. There is a compelling case for continued substantial funding of research in the Eighth Framework Programme, not least as one of the key tools to achieve the Europe 2020 goals. A reasonable level of funding per year could be that reached in the last year of FP7. In relative terms, this would mean that the percentage of the total EU budget that FP7 will have when it ends should be regarded as a minimum. Funding at this rate would help to overcome the problem that many individual proposals adjudged to be excellent are not funded which, coupled with the substantial effort needed to prepare a proposal, may deter some of the best researchers from applying.
4. **A well-articulated innovation** strategy needs to ensure that instruments and priorities encourage participation from a broad spectrum of small and large enterprises, universities and research and technology organisations. The research and innovation strategy also has to take into account the need to support European enterprises' efforts to integrate in global innovation networks. The open, international character of the FP7 could therefore be expanded. Specific actions should be taken in the context of the evolving financial crisis to channel financial support for research and innovation to areas of crucial importance for European competitiveness. An increased emphasis on monitoring progress in FP7 projects is needed if the intended impact is to be achieved. Innovation also requires more attention to the distinctive needs of industry, among which reductions in administrative burdens are vital.
5. **Simplification needs a quantum leap**, and the Expert Group calls for all Directorates-General and agencies rapidly to implement the short-term simplification measures recently put forward in a Communication by the Commission and to ensure that they are applied rigorously from 2011-2013. Coherence of procedures and approaches between Commission Directorates General and the Executive Agencies responsible for administering FP7 is of crucial importance. The Expert Group proposes that the Commission consider the upcoming revision of the Financial Regulations as an opportunity to create more flexible conditions for research in subsequent FPs. In addition the Group pleads for the Commission to switch from its present low-risk/low-trust attitude to a more trust-based and risk-tolerant approach.
6. **The mix of funding measures** in FP7 and successor programmes should strike a different balance between bottom-up and top-down approaches to research, with greater emphasis in the specific programme *Cooperation* during 2011-2013 on more open calls. It is also important to ensure that education does not become the forgotten side of the Knowledge Triangle and thus that the linkages between research and innovation are adequately complemented by research training.
7. **A *moratorium* on new instruments** should be considered until the existing ones have been sufficiently developed and adequately evaluated, and care should be taken to avoid a confusing proliferation of instruments.

8. **Further steps to increase female participation in FP7 should be taken in its remaining years,** in particular:

   - Measures to boost female participation should be reinforced throughout project life-cycles, paying particular attention to overcoming gender-specific obstacles which women face.

   - The Commission should reinvigorate its approach to promoting female scientists and should aim to galvanise Member States to address gender gaps, especially where female researchers face specific obstacles, while ensuring that it redoubles its efforts to achieve gender balance with a specific strategy for the remainder of FP7. It should accept its responsibilities in a leadership role, with the support of the Member States, to use positive measures for the training of female scientists, including a dedicated scheme under the Marie Curie actions.

   - The 40% target for female participation in Programme and Advisory Committees should be sensitively but rigorously implemented.

9. **To pave the way for increased participation from Member States that are under-represented** greater prominence should be given to improved connections between the Structural Funds and the FP. Moreover, within the FP, the importance of the *People* programme for developing the potential for scientists from EU12 should be stressed, as should the scope for using infrastructures.

10. **Opening of the FP7 to international cooperation** is of great value. As other regions rapidly strengthen their research and innovation capacities (with Asia perhaps being the most notable example), but also as the urgency to address global challenges grows, the ability of European research and innovation to link up with other regions, markets and research and innovation agendas and to meet global needs for innovative solutions to 'Grand Challenges' becomes increasingly important. A review based upon a thorough analysis of the current strategy towards international cooperation is needed. The international perspective must be integrated into all programmes and instruments.

# 1 Introduction

The Seventh Framework Programme is a substantial and crucial component of the European research effort, and manifestly represents a major investment with distinctive characteristics. The formal legislative basis for FP7 asserts its global ambitions, stresses that the Framework Programme should 'be strongly focused on promoting and investing in world-class state-of-the-art research, based primarily upon the principle of excellence', and links it to both the creation of a European Research Area and to 'the development of a knowledge-based economy and society in Europe'. It has the goals, as 'set out in the Treaty, of strengthening the scientific and technological bases of Community industry, thereby ensuring a high level of competitiveness at international level'.[2] These are highly-ambitious goals which, on the one hand, testify to the breadth of vision behind FP7, while on the other they risk engendering unrealistic expectations of what can be achieved with the resources devoted to the Framework Programme. FP7 is divided into four specific programmes: *Cooperation*, *Ideas*, *People* and *Capacities*. The latter two finance activities on training and mobility as well as capacity building, while the former two finance research activities. A separate budget line finances the Joint Research Centres (JRC) which undertakes research directly for the European Commission.

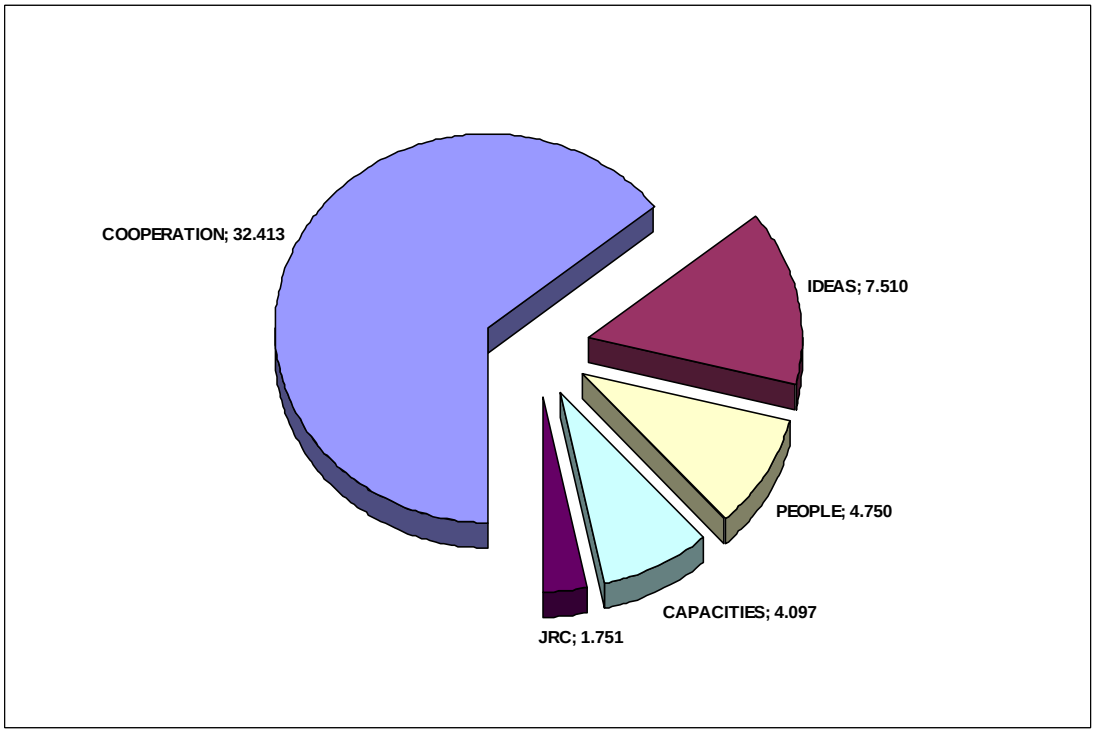
It is the world's largest research program, open to participation from any country. It has grown significantly from earlier FPs, and has a total budget of some €50 billion over its seven years. The breakdown of funding according to the four specific programmes is shown in Figure 1. In its first three years, FP7 has already provided funding for some 50,000 research teams from across the Union, and fostered collaboration with associated countries and other parts of the world.

The FP7 builds on and goes far beyond previous Framework Programmes, and will, in turn pave the way for an FP8 which is already in the early stages of preparation. FP7 was launched at the same time as new initiatives to enhance the European Research Area (ERA) through the 'Ljubljana process'. Indeed, FP7 is the key instrument to develop the ERA, building on progress under FP6, as it represents a huge common pot of funds at the European level. A recent FP7 progress report stated that:

> 'In December 2008, Member States adopted their joint vision of the European Research Area (ERA) in 2020. Through the 'Ljubljana process', they committed to a process of working together to realize this vision, in mutual partnership and with the Commission. The vision of ERA is one which offers the right conditions and incentives for high-impact research and R&D investments, adding European value by fostering healthy competition for excellence, especially between researchers; allowing researchers, scientific knowledge and technology to circulate freely ('fifth freedom'), while supporting coordination between research funders and cooperation between industry and academia'.

[2] From the Decision No 1982/2006/EC of the European Parliament and of the Council concerning the Seventh Framework Programme.

**Figure1 FP7 budget breakdown in € million.***




* The EURATOM FP7 budget of €2.7 billion over 5 years is not included here.

Source: European Commission (2009) Third FP7 Monitoring Report (Monitoring Report 2009)

## 1.1 The Strategic Goals of FP7

FP7's aims and objectives were laid down in the Decision 1982/2006/EC of the European Parliament and the Council of 18 December 2006. It stated that 'The overriding aim […..] is to contribute to the Union becoming the world's leading research area.' Among the objectives of the Framework Programme, transnational cooperation, frontier research based on excellence, and the strengthening of the human potential in research and technology were particularly highlighted. Other objectives laid down by the European Parliament and the Council were the promotion of a dialogue between science and society, facilitating the career development of researchers, strengthening of research capacities and ensuring wide use and dissemination of the knowledge generated by the research funded through the Framework Programme.

The Expert Group notes that the context for FP7 has dramatically changed since the original decision in 2006. As the EU struggles to emerge from the severe economic crisis of 2008-2010, several challenges have to be confronted. The 'smart, sustainable and inclusive growth' slogan at the heart of the Europe 2020 agenda, points to the broad directions for socio-economic development over the next decade, but Europe also has to find ways of coping with longer-term transformations, such as the ageing of the population, the emergence of new competitors or the imperative of shifting to a low-carbon paradigm. In all these areas – sometimes known as 'Grand Challenges' - research has a vital role to play in generating the new knowledge needed to facilitate change, to support innovation and to enable society to accommodate diverse challenges. In particular, the 'smart' component is explicitly identified in the Europe 2020 agenda as being about 'knowledge and innovation as drivers of future growth', with research performance portrayed as crucial.

Meeting these challenges will be facilitated by coherence in policy approaches and by avoiding fragmentation and duplication of effort, a point stressed in the description of the

Innovation Union flagship initiative for Europe 2020 which highlights the need for EU level action to complete the ERA and to develop a strategic approach to research and innovation. The recent Commission communication on the Innovation Union states explicitly that innovation is 'our best means of successfully tackling major societal challenges, such as climate change, energy and resource scarcity, health and ageing, which are becoming more urgent by the day.'[3]

### 1.1.1 Why the EU level?

What constitutes added value for a tier of government is never easy to define. Indeed, there is often enough room for argument to justify different assignments of responsibilities among different levels of government depending on political preferences. Nevertheless, it is worth asking 'why the EU?' in the domain of research funding and considering why and how spending at the EU level can generate higher returns for European society than spending at other levels. Several arguments why EU-wide R&D policies should complement those of national and regional governments have been presented. A key one is that only through EU-wide R&D policies can an open, integrated and competitive ERA be developed. In this way, the full potential of European co-operation can be achieved and all regions would have a fair chance to find their competitive strengths through 'smart specialisation'. This process needs a truly open competition of ideas, innovations and researchers.

As a paper written by Michael Stampfer (a supporting expert for the FP6 Ex post Evaluation) notes, the fuzziness of definitions of added value is exemplified in research policy, where competing definitions are applied in different contexts and over time, and there is a tendency for different actors to use the interpretation that best suits their purpose.[4] There is also the problem that the likely added value is only assessed in appraising projects, and hence only *after* some of the big decisions about the structure of the programme have been taken. As Stampfer puts it, it would be better if this could be reversed: 'instead of "goals have to follow the instruments" the other way round could be worth a try'. Stampfer also highlights the difficulty of translating added value into operational goals and he expresses scepticism about claiming that ever more cooperation is a strong indicator of added value.

The Expert Group argues that among the key rationales for an EU level are:

- The scope for pooling resources to attain critical mass, especially where a multi-disciplinary approach is needed
- The ability to attract and retain top researchers in global markets and to be the location of choice for the performance of research by companies
- A developmental role in building up research capacity, including infrastructures, in regions of the Union or in research areas that would otherwise be unable to command sufficient resources if they rely exclusively on national or sub-national government funds
- Achieving sufficient mobility of researchers to facilitate improved accumulation of knowledge and skills, leading to higher productivity of researchers
- Assuring coherence with other policy areas, both at national and EU levels, notably the broad economic and social objectives in the Europe 2020 and other EU level strategies.

[3] European Commission (2010): Europe 2020 Flagship Initiative Innovation Union, SEC (2010) 1161. Brussels, 06.10.2010.

[4] Stampfer, M. (2008): European added-value of Community research activities. Expert analysis in support of the ex post evaluation of FP6. October 2008.

## 1.2 Terms of reference and approach taken by the Expert Group

The Expert Group was appointed by DG RTD in the spring of 2010 in line with article 7(2) of the EC Seventh Framework Programme Decision which provides that: '*No later than 2010, the Commission shall carry out, with the assistance of independent experts, an evidence-based interim evaluation of this Framework Programme and its specific programmes building upon the ex post evaluation of the Sixth Framework Programme.*'[5]

The Group was given terms of reference which are appended to this report and has the overall objective of providing an interim evaluation of FP7, based on the specific questions set out in Box 1.

**Box 1 Overview of Questions Addressed to the Expert Group**

The Group was asked to provide answers to seven over-arching questions, several of them broken down into more specific questions, which are

1. *How far has FP7 achieved its general objectives, including those of the specific programmes?*
2. *How can the impact of FP7 and future Framework Programmes on shaping the European Research Area and other major policies be improved?*
3. *Does FP7 play an adequate role in positioning Europe on the global map of science and technology?*
4. *Are the novel measures (such as European Research Council, Joint Technology Initiatives, Article 169, ERA-NET Plus, Risk Sharing Finance Facility) efficient with respect to reaching their intended objectives?*
5. *How can the impact and added value of collaborative research that cuts across scientific disciplines, industrial sectors and policy fields be further enhanced with a view to better address large societal challenges?*
6. *To what extent have simplification measures been effective?*
7. *What progress has been made under FP7 concerning the major issues which were highlighted in the FP6 evaluation report as needing further analysis, notably the participation, role and achievements of industry (including SMEs) in the Framework Programme?*

The mandate was to examine all research programme activities under FP7 and to come up with recommendations for the future implementation of FP7, as well as to assess whether recommendations from previous evaluations of Framework Programmes had been adequately followed-up and implemented. The Expert Group conducted its work by collecting written and oral evidence, drawing on supporting experts and the input of the Commission services, complemented by particular tasks undertaken by individual Group members. The Group met on eight occasions and individual members had frequent exchanges by phone and email.

Extensive use was made of evaluations conducted on specific aspects of FP7, and valuable input was received from self-assessments provided by services responsible for different aspects of FP7 and from an open 'stakeholder' consultation which elicited some 500 responses. Five supporting experts produced reports on specific topics covered in the evaluation. In addition, the Expert Group drew on a wide array of published and unpublished documents, many of which were submitted by interested parties. While there are still some

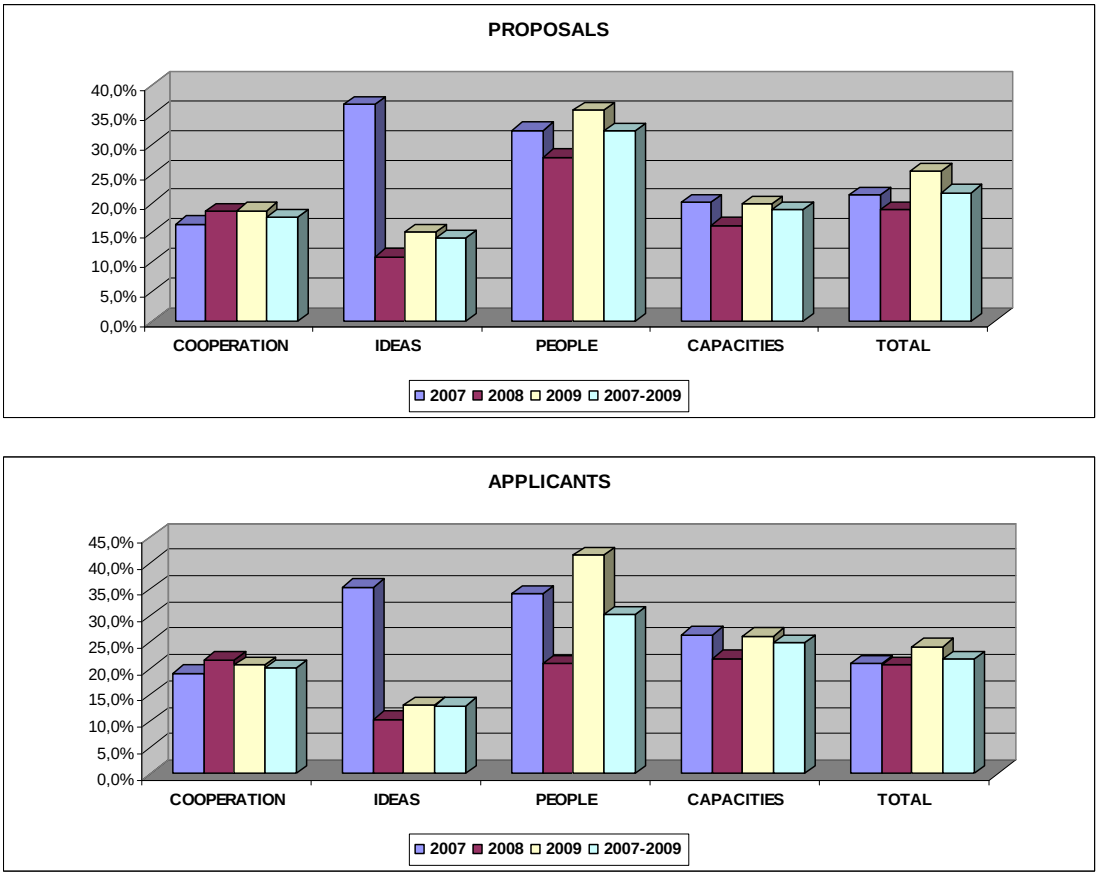
[5] OJ L 412, 30.12.2006, P. 001.

problems of consistency in the data,[6] the Expert Group has been greatly helped in its work by the fact that the statistical data on FP7 are significantly better than those available for previous FPs. The hundreds of documents associated with the evaluation were posted on the CIRCA database which was an invaluable communication tool among members of the Expert Group.

## 1.3 Statistical overview of FP7

The raw statistics on FP7 are impressive. In the three years 2007-2009, 170 calls for proposals were concluded, eliciting 55,379 proposals, of which 41,474 passed the formal eligibility criteria or the first stage of two-stage calls, and 21.8% (9,121) were 'retained for negotiations' which normally means that they will be funded. The average number of participants, in projects evaluated and retained alike, is 5.6. Some 13,300 participations by 'private for profit' organisations were included in the retained proposals between 2007 and 2009.[7]

**Figure2 Success rates for different components of FP7**




Source: European Commission, Third FP7 Monitoring Report (Monitoring Report 2009)

Success rates have risen slightly between 2007 and 2009, from just over a fifth to just under a quarter in terms of proposals retained, but is running at just over 20% in terms of actual EC funding, a possible implication of which is that the average size of applications has contracted

[6] Although there is good quality reporting of many basic statistics on FP7, the Expert Group has first-hand experience of difficulties in obtaining certain information because of difficulties in cross-referencing databases.

[7] The participation patterns are analysed in greater detail in section 1.2 of: European Commission (2010): Third FP7 Monitoring Report (Monitoring Report 2009). Brussels 13.07.2010.

a little. Success rates vary substantially, being highest for *People*[8] and lowest for *Ideas* (see Figure 2), with the *Ideas* figures possibly reflecting the very high initial interest in the new European Research Council and the need for the research community to learn what it expects and how to 'play' it.

The data in Figure 2 show a much higher success rate for the ERC than is discussed in section 4.1 below. The main reason is that, in this figure, the 2007 data exclude proposals rejected at the first stage of what was a two-stage submission process, especially as the very first ERC call was one that attracted a phenomenally high number of submissions.[9] This method of calculation obviously increases the measured success rate, but does not raise the perceived probability of having an application funded, certainly as seen from the perspective of applicants and evaluators. The Expert Group is conscious of the dilemmas around how best to present success rates for two-stage proposals, but suggests they might be resolved by presenting both first and second stage success rates in future Monitoring Reports.

As Figure 3 (also taken from the Monitoring Report) shows, *Cooperation* and *People* account for the highest number of grants, with those in the former generally much larger in value than in *People*.

According to Commission data,[10] SMEs account for 16.5% of partners in signed grant agreements under *Cooperation* and 14.7% of requested Community contributions. Just under two-thirds of SME involvement is in *Cooperation* and a further 27% in *Capacities*, but there are hardly any SME participants in *Ideas* (just 3 out of 903). SME participation in the specific programme *People* is quite low overall, but varies substantially among the different Marie Curie actions.[11]

All Member States are extensively involved in FP7, although there are clearly differences in the intensity of involvement (see Third FP7 Monitoring Report for details). The participation of candidate and association countries is very heterogeneous. Switzerland, Norway and Israel dominate in terms of applications, and with marginally higher success rates, also obtain the bulk of the funding. Indeed, Switzerland (which, it should be recalled, is the location of CERN) alone accounts for a little over half the total contribution made by the EC to retained projects for this group of countries over the period 2007-2009.[12] According to the monitoring report, 75% of research topics contribute to at least one of the operational objectives of the EU's Sustainable Development Strategy (SDS) and 65% of EU funding under FP7 goes to projects that tackle SDS issues.

[8] The success rate in *People* is relatively high on average (32,2%), but shows great divergences among the actions, ranging from 8% in ITN to more than 60% in new schemes (IRSES and COFUND).

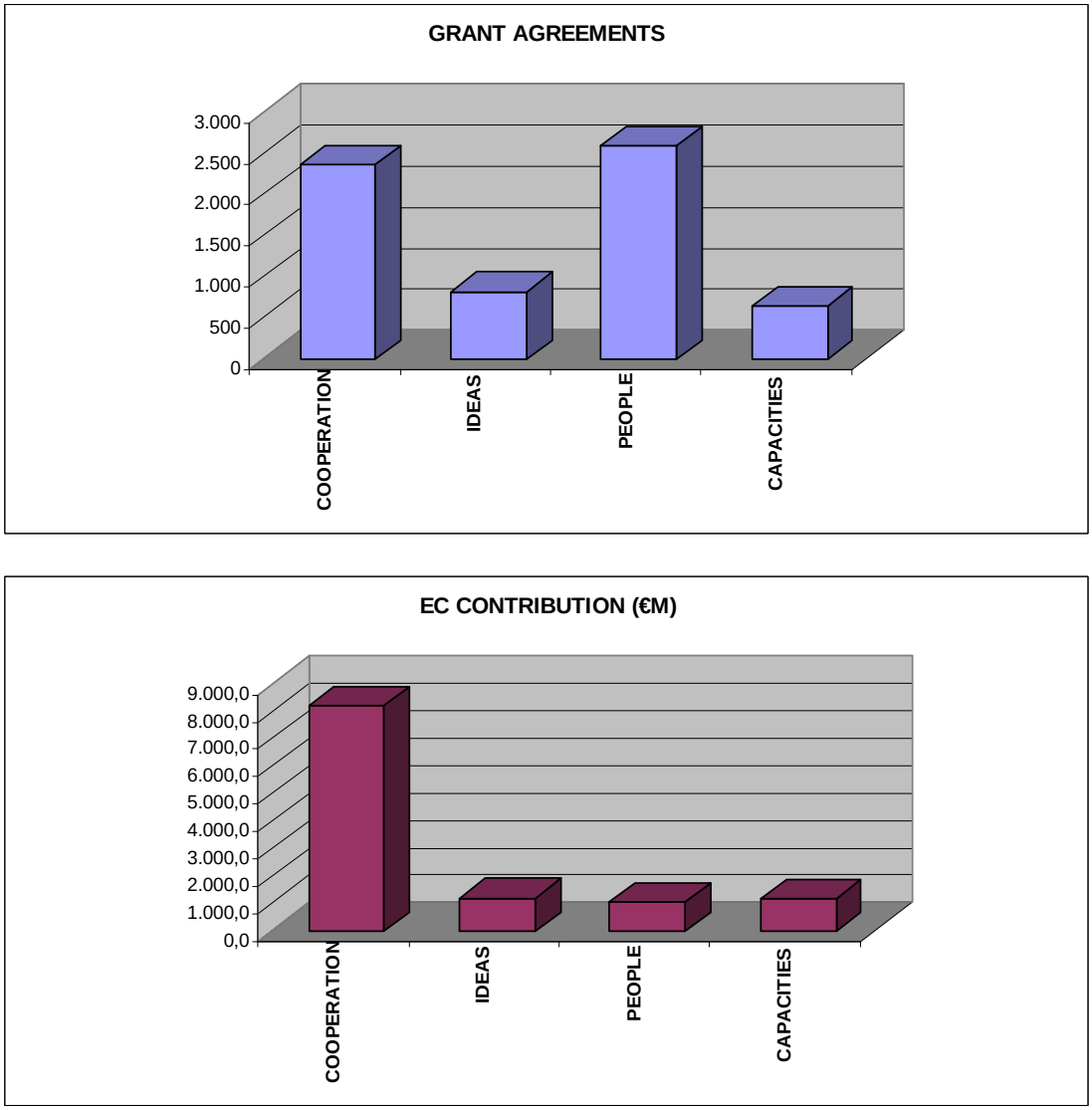
[9] In subsequent ERC calls, there was a one-stage submission, but a two-step review of the proposal, with only those proposals passing the first step being subject to the second, fuller review.

[10] European Commission (2010): Mid Term Report on SMEs' Participation in the 7th R&D Framework Programme. Brussels, 27.09.2010.

[11] Third FP7 Monitoring Report, op. cit.

[12] Third FP7 Monitoring Report, op. cit.

**Figure 3 Numbers of grants and EC contribution by specific programme**




Source: European Commission, Third FP7 Monitoring Report (Monitoring Report 2009)

The sheer number of participants testifies to the broad reach of FP7 – even allowing for double-counting from the fact that individual research groups or organisations may be involved in multiple applications. However, given the effort involved in preparing and submitting a proposal, the number of applicants that are rejected points to a substantial opportunity cost.

### 1.3.1 FP7 in relation to national spending on research

Aggregate public investment in research is remarkably similar on both sides of the Atlantic. In 2008, government budget appropriations or outlays on research and development (GBAORD) in the EU as a whole amounted to some €89.8 billion, a little below the figure of €96.8 billion in the US (see Table 1). However, if the FP expenditure (most of it FP7, but some accounted for by the latter stages of FP6) of €6.4 billion is added, the EU total is just short of the US at €96.2 billion. The proportion accounted for by the FP is 6.7% of the total public research effort, although the rise anticipated in FP spending in the latter years of the Framework Programme can be expected to take the proportion up to closer to 10%. It is noteworthy that the FP7 annual budget exceeds the annual research spending of all but the five largest Member States. The alignment of FP7 with the full seven years of the Multi-

annual Financial Framework (MFF) places research more explicitly at the core of EU activity. It also facilitated a more strategic approach by becoming longer in duration than previous programmes which had lasted four to five years.

**Table 1 Government budget appropriations and outlays on R&D (€ billion)**

| GBAORD | 2008 |
|---|---|
| Germany | 19.8 |
| France | 14.6 |
| Italy | 9.9 |
| Spain | 11.6 |
| UK | 11.7 |
| Other EU15 | 17.8 |
| EU12 | 3.8 |
| | |
| **EU 27 Member States** | **89.8** |
| | |
| FP7 | 5.6 |
| Other FP | 0.8 |
| *Total FP* | *6.4* |
| | |
| **Total EU** | **96.2** |
| [% share of FP] | *[6.7]* |
| | |
| **US** | **96.8** |

Source: Eurostat, 2010 edition of *Science, Technology and Innovation in Europe*; DG Budget of the European Commission, *Financial Report 2009*

The Community budget also supports investment in research capacity through the Structural Funds, although because of national and regional differences in how these resources are spent, it is not possible to estimate a directly comparable figure for the total value of this complementary funding. Data obtained from DG REGIO suggest that around €50 billion was earmarked for research support over the period 2007-2013, an amount comparable to FP7. Hence, for some recipients, it constitutes a substantial addition to national funding of R&D.

### 1.3.2 Data on the processing of applications

The Commission monitoring report reveals that the mean time to grant (TTG) is 350 days (median, 335) and has been rising as some of the more lengthy negotiations from the early FP7 calls are concluded (Table 2). Inclusion of these long-lasting negotiations has the arithmetic effect of raising the average time, but does not of itself prove that there is a deterioration in TTG, and in fact the Commission comment on these data is that this is both to be expected and not unreasonable. More significantly, it is counter-balanced by evidence that the TTG for projects funded in later calls has been falling. Consequently, it is hard to ascertain whether or not improvements are occurring.

Data show that one in 24 proposals gave rise to a request for 'redress', that is a form of appeal about the handling of the proposal, potentially leading to its re-evaluation, but that only 86 out of 1,601 requests were upheld, and of these only 19 actually re-evaluated.[13] As a proportion of

[13] The Commission's explanation for the difference is that for the 65 cases not re-evaluated 'the proposal failed anyway for other reasons or because the identified problem was minor and not crucial to the experts' evaluation'.

total applications, the rate of re-evaluation is tiny at 0.05% and has to be taken as strong evidence that the system is fair. However, redress appears to be done in-house by Commission services, with a process in which, as the Commission's Third FP7 Monitoring Report puts it, 'Directorates nominate officials for jury service'. This could appear to be lacking in independence and may partly explain why redress attracts some negative comment in the 2010 survey of NCPs.[14]

**Table 2 Time to grant in days for FP7 grant agreements signed in 2007-2009 by thematic area (as of May 2010).**

| SPECIFIC PROGRAMME | THEMATIC AREA | GRANTS | MINIMUM | MEDIAN | MEAN | MAXIMUM | STD |
|---|---|---|---|---|---|---|---|
| COOPERATION | Health | 379 | 96 | 417 | 439 | 804 | 126 |
| | Food, Agriculture and Fisheries, and Biotechnology | 144 | 282 | 450 | 448 | 650 | 85 |
| | Information and Communication Technologies | 820 | 178 | 248 | 252 | 466 | 41 |
| | Nanosciences, Nanotechnologies, Materials and new Production Technologies | 244 | 190 | 401 | 394 | 609 | 77 |
| | Energy | 149 | 63 | 338 | 337 | 544 | 103 |
| | Environment (including Climate Change) | 181 | 47 | 530 | 493 | 651 | 105 |
| | Transport (including Aeronautics) | 261 | 223 | 541 | 525 | 926 | 104 |
| | Socio-economic sciences and Humanities | 110 | 223 | 429 | 432 | 782 | 115 |
| | Space | 25 | 94 | 533 | 478 | 724 | 150 |
| | Security | 60 | 228 | 556 | 530 | 929 | 194 |
| | General Activities | 19 | 112 | 374 | 324 | 493 | 138 |
| IDEAS | ERC | 835 | 160 | 318 | 314 | 602 | 69 |
| PEOPLE | Marie-Curie Actions | 2.634 | 122 | 322 | 324 | 650 | 96 |
| CAPACITIES | Research Infrastructures | 150 | 127 | 365 | 372 | 641 | 119 |
| | Research for the benefit of SMEs | 248 | 177 | 443 | 456 | 749 | 101 |
| | Regions of Knowledge | 42 | 234 | 306 | 333 | 589 | 97 |
| | Research Potential | 102 | 239 | 358 | 353 | 469 | 53 |
| | Science in Society | 79 | 56 | 386 | 370 | 573 | 124 |
| | Support for the coherent development of research policies | 12 | 53 | 225 | 256 | 538 | 128 |
| | Activities of International Cooperation | 44 | 227 | 310 | 324 | 717 | 100 |
| **Total** | | **6.578** | **47** | **335** | **350** | **929** | **118** |

Source: European Commission, Third FP7 Monitoring Report (Monitoring Report 2009)

Opinion was quite polarised between those NCPs who found the procedure poor or very poor and those who adjudged it to be good or very good, although it is noteworthy that more than a third offered no opinion. The principal cause for concern is that redress is overly focused on administrative criteria and neglects the content of proposals.

Separate but similar redress procedures are in place for the ERC, administered by the Executive Agency, and these also resulted in appeals from roughly 1 in 25 applicants. A somewhat higher proportion went on to be re-evaluated than for the FP overall, but the outcome was that only one project had the result of the evaluation reversed.

[14] In Spring 2010, a survey was conducted among National Contact Points (NCP) to collect their views, comments and suggestions with regard to FP7. The questionnaire was dispatched to 949 FP7 National Coordinators and FP7 Coordinators for Specific Fields from the 39 EU Member States and associated countries; as a result, 211 responses were received from 36 different countries (a response rate of 22,2%).

# 2 The policy context for the 7th Framework Programme

Europe is now slowly emerging from the most severe global economic and financial crisis in decades and a very particular crisis within the Eurozone, which is still far from fully resolved. But it also has to shape the long-term growth agenda in a manner consistent with confronting major societal challenges including, *inter alia*, the long-term implications of climate change, an ageing demographic and energy shortages.

At the European and global levels, the world is much more interconnected and this leads to the need for globalised solutions across a range of policy areas. Furthermore, some 'levelling out' of global players is also evident as the geo-political situation evolves.[15] For Europe, globalisation challenges are of two types:[16] how to address jobs losses as traditional sectors decline and other economic activities relocate outside Europe; and how to increase innovation and productivity to maintain international competitiveness in Europe's areas of potential strength. An important underlying aim of FP7 is to consolidate and strengthen the European Research Area (ERA), a notion put forward in 2000 as a strategic vision to create a more consistent research landscape in the European Union, including not only EU-level research policy but also encompassing Member State level.[17]

## 2.1 ERA

The overall idea of ERA is to overcome the problems of fragmentation, under-investment, and lack of consistency of research in the EU. The Lisbon Treaty gives a renewed impetus to the ERA and, in Title XIX of the Treaty on the Functioning of the European Union (TFEU), spells out the ambition of establishing a European Research Area (Article 179.1), while Article 182.1 provides for a research Framework Programme that funds research. Other articles in Title XIX pave the way for supplementary programmes undertaken by certain Member States with Community participation, for cooperation with third countries and international organisations and for joint undertakings. These provisions highlight the wide-ranging nature of the ERA, and the variety of conceivable arrangements for advancing it. They also offer considerable latitude in the structuring of research initiatives.

As a result of the 2007 stakeholder consultation on the ERA through the Green Paper, the European Commission published five follow-up ERA initiatives to speed up its implementation:

- A recommendation on knowledge sharing aimed at improving the knowledge and intellectual property transfer between public research organisations and private companies
- A communication on better careers and more mobility – A European partnership for researchers
- A communication on Joint Programming in research
- A new legal framework for European Research Infrastructures (ERIC) building on the European Strategy Forum for Research Infrastructures (ESFRI) process underway since 2002
- A communication on international science and technology (S&T) cooperation.

[15] Commissioner Potocnik at the Lund Conference "New Worlds – New Solutions". July 2009.

[16] A Knowledge-intensive future for Europe. Expert Group Report. October 2009.

[17] European Commission (2000): Towards a European Research Area. COM (2000) 6. Brussels, 18.01.2000.

These key initiatives were later brought into the long term approach of the ERA Vision 2020. The components of the ERA Vision 2020[18] could be defined according to the following: ERA in response to socio-economic needs and concerns, and ERA in support of an efficient European research system. With respect to the latter, what is becoming more explicit (politically and publicly) is the need to demonstrate a clear economic impact from research investment in the face of the squeeze on public budgets engendered by the economic crisis. Even if public budgets start to grow again, policymakers will have to demonstrate transparent and robust priority setting for that investment.

Research and its connections to the 'Innovation Union' featured very prominently in the recently adopted Commission communication on the 2008-2009 budget review.[19] Clearly, there are going to be tough negotiations about the future balance of EU spending and difficult compromises that will impinge on the scale and scope of any future research envelope. However, it is also clear that ERA objectives are crucial in this regard and part of the negotiation may turn on the extent to which other budget lines, notably the Structural Funds, can be further orientated towards research and innovation.

That the ERA should be constructed as an essential element of Europe's response to a series of 'Grand Challenges' was based on the argument that the case for further investment and high-level attention being given to research and innovation needs to be supported by a clearer *public* appreciation that research, and the skills that research sustains, are critical elements in addressing the economic, social and environmental problems facing the EU. The visibility and understanding of the public regarding the ERA is, though, rather limited, despite the evidence that Europe is achieving success on the global stage. This success is demonstrated in research[20] using the ISI database on publication patterns which shows that European scientific output, as measured by the number of papers published in journals, has doubled since the early 1980s, and has increased substantially and steadily over the last decade. In EU15, 1.85 million papers were published over the five year period from 2000-2004, but in the second half of the decade, the aggregate rose to 2.35 million, a 27% increase. From an ERA perspective an encouraging sign is that the increases recorded in Greece, Ireland and Portugal were much higher than in the traditional bastions of research of France, Germany and the UK, although the latter three Member States continue to dominate in the volume of publications. In the EU12, the increase between the two five-year periods was more rapid at 54%, while between the start and finish of the decade, the number of publications doubled.

## 2.2 Europe 2020

FP7 also has to relate to the evolving agenda for the Europe 2020 strategy and to ensure that it addresses all three elements of the 'Knowledge Triangle' (research, education, innovation). Under the strategy, Member States are required to have their own National Reform Programmes setting out how they will fulfil common goals, and both quantitative and qualitative targets. However, Europe 2020 also entails close connections between Member State and EU level policies. This encompasses both competition and collaboration, with merit-based competition between Member States and between research performers, which, in turn, would facilitate stronger prioritisation and specialisation.

The Europe 2020 strategy places great emphasis on knowledge and innovation, a more sustainable economy, high employment and social inclusion. There are many challenges, but

[18] Council Conclusions on the Definition of a 2020 Vision for the European Research Area. December 2008.

[19] European Commission (2010): The EU Budget Review, SEC (2010) 7000. Brussels, 19.10.2010.

[20] Adams, J. (2010): Report on bibliometric analysis. Expert analysis in support of the Interim Evaluation of FP7.

developing sustainability across all policy areas is probably the most urgent. Especially in relation to innovation, Europe has to become more attractive for business (and citizens) implying that how investments are made, whether within or between the three components of the Knowledge Triangle, will be crucial for ensuring success in productivity, competitiveness and employment. A sound basis for synergies between policy areas will be required.

The EU Council Conclusions of 26th May 2010 acknowledge that 'research and innovation policy has moved up in terms of EU policy priorities and become widely recognised as a key enabler of competitiveness, productivity growth and sustainability to tackle global and societal challenges'. In the same spirit, the Commission communication on the Innovation Union argues strongly that Europe's 'future standard of living depends on our ability to drive innovation in products, services, business and social processes and models. This is why innovation has been placed at the heart of the Europe 2020 strategy'.

At the same time, it is becoming increasingly likely that the world in 2025 will be less 'western' with some believing that we are already moving into the 'Asian Century', as we witness impressive economic growth there coupled with strategic investments comparable in scale to other large economic blocs. This must have implications for the global knowledge production system. Whilst the ageing population in Europe presents its own challenges, it also creates opportunities in terms of markets for 'silver technologies'. In the face of global competition all of this represents a clear challenge to Europe to be clear and coherent regarding its own setting of priorities and to act in a more co-ordinated way to adapt.

## 2.3 FP7 in global science

This evidence of a fundamental shift in the geography of global knowledge and innovation challenges the traditional dominance of Europe, North America and Japan in the global production of knowledge and innovation, notably from the BRIC[21] countries and others. Indeed, it is evident that countries such as China, India and Brazil are now recasting their economic development models, drawing on a combination of rapidly growing human capital, alongside research and development investments. They are also alert to the scope for exploiting expanding markets for innovative goods and services, not least in 'green' technologies where China, especially, has a strong interest in solving problems. For the EU this is both a threat and an opportunity, and highlights the need for an outward-looking FP.

FP6 was opened for worldwide participation and, while developed or industrialised countries were not in general eligible for funding, funding conditions were similar for EU Member States, associated countries and emerging or developing countries. However, participation of non-Member States or associated countries in FP6 was limited to 5.7%, and these countries received no more than 2.3% of the FP6 budget. Only 7% of these contributions went to developed countries, of which the largest part (a mere €2.5 million per year) accrued to the US. As pointed out in the FP6 Ex post Evaluation, this 'constitutes a very narrow link to the strongest scientific nation on earth'.[22] The evaluation also points out that the FP6 links to the BRIC economies were weak, which perhaps indicated that it was not able to connect the EU adequately with these strategically important potential markets and research partners.

The Commission's 2008 Communication on international science and technology cooperation described actions to be developed by Member States and the Commission to make the ERA

[21] BRICs is a term used to represent four emerging economies: Brazil, Russia, India and China, with some commentators adding South Africa – hence BRICS.

[22] Evaluation of the Sixth Framework Programmes for Research and Technological Development. Report of the Expert Group, February 2009.

more open to the world. This Communication identified three main principles and approaches which would guide its initiatives and activities:[23]

1. *Europe cannot cooperate with all countries on all topics. Choices of research topics and third country partners have to be made.*
2. *A critical mass of resources in support of these choices has to be guaranteed.*
3. *Cooperation with scientifically advanced partners will differ in nature from that with countries which are developing their science base; but both types of cooperation are needed.*

In assessing Europe in global science, it is noteworthy that Europe overtook the US in 1995 in the volume of publications, although the share of global output of researchers in Asia-Pacific and, to a much lesser extent, Latin America has increased much more rapidly, with the former having just overtaken the US. The share of EU-based researchers in total global publications in the journals recognised by ISI was broadly stable up to the turn of the millennium, but has edged down since, reflecting the rapid increase in the share of Asia-Pacific, whereas the US share has fallen steadily over the last fifteen years. The bulk of what is recorded in these data will reflect research concluded before FP7 funding came on stream, so that any inferences drawn relate more to the impact of FP6 than FP7.

Although there are caveats about these data,[24] it is encouraging that Europe has, so far, retained the highest share of global publications. However, the likelihood is that the huge investments in research by Asia-Pacific will propel the region to first place within the next few years and other data tell a less positive story. In a study of Chinese co-authorships, it is shown that the country's total number of international co-publications is increasing, but that the shares of North-American collaboration partners is steady and high, while 'EU-27 are losing ground very fast'.[25] According to these authors, one of the reasons behind this development is that the Chinese research system focuses on applied research fields, where North-American researchers have a high standing, whereas Europe is known for its strong basic research orientation.

[23] European Commission (2008): A Strategic European Framework for International S&T Cooperation, COM (2008) 588. Brussels, 24.09.2008.

[24] These counts of publications do not make any allowance for the quality of the journal, other than the general eligibility criteria applied by ISI. In other words, publication in a top-ranked journal counts equally with a bottom-ranked journal. There are also potential complications in the way in which joint authorship is recorded and in self-citation. In some scientific disciplines where the practice is to be very inclusive, multiple authors from one geographical region would count only once, but a single joint author from another region would also count once. Without much more complex analysis, it is impossible to know whether this imparts any systematic bias to the results.

[25] Rainer Frietsch, et al. (2008): Bibliometric data study: Assessing the current ranking of the People's Republic of China in a set of research fields. Fraunhofer ISI Discussion Papers Innovation System and Policy Analysis, No. 15.

# 3 The specific programmes and orientations assessed

Over the years the Framework Programmes have evolved in three main ways: steady increases in the annual budget from several hundred million euro up to an average of €7 billion over the duration of the Seventh Framework Programme; extension of the Union's activities into new scientific and technological fields; and diversification of mechanisms, types of financial support and intervention methods. In FP7, the portfolio covers both projects and transnational networks for collaboration in research, individual grants, specific measures for SMEs, support schemes for cooperation and coordination at various governance levels and accompanying measures such as studies and conferences. FP7 is characterised by a mix of continuity in established instruments and the development of a range of novel measures.

The FP's traditional focus has been on collaborative R&D involving a minimum number of partners from different Member States. Programmes to promote the mobility and training of researchers also have a long history and what are now called Marie Curie actions are into a second decade. These instruments, together with the more limited investment to date in research infrastructures, have had a pronounced structuring effect on the research landscape.

A number of the new instruments deployed in the Sixth Framework Programme are retained in FP7. They include ERA-NETs which bring together European, national and regional research programmes and the Marie Curie initiatives aimed at forming international networks and increasing researcher mobility. A new implementation mode has been adopted in which policy remains the responsibility of the Commission, but the administration of applications and grants has become the responsibility of a newly created Research Executive Agency. This outsourcing model took time to be put in place, but now seems to be working well enough.

## 3.1 Cooperation

The specific programme *Cooperation* has both the biggest share of FP7, accounting for nearly two-thirds of the planned expenditure, and is the component with the longest pedigree. The Expert Group finds that, for the most part, it works well. An important attribute is that it is unique in being the only source of public funding for collaboration across national borders and, as such, has a distinctive European added value. Two responses to the public consultation carried out for this evaluation put it well:

> '*Funding for collaborative research across Europe and worldwide is not offered elsewhere and is very important*'
>
> '*One of the key aspects of funding collaborative research is the enduring impact of bringing researchers together across the EU and beyond to share knowledge and develop critical mass in R&D, which could not be achieved to the same extent at national level*'

Among the common criticisms of the specific programme are that it does not always attain the highest standards of excellence, that its Work Programmes are often too narrowly defined and that the insistence on highly specified deliverable leaves insufficient room for flexibility in research projects. As in other areas of the FP, complaints about the lack of simplification are widespread.

The criticism of excellence is countered both by the self-assessments by the Commission services responsible for the ten areas of the *Cooperation* programme and by the responses to the stakeholder consultation. They offer a generally positive view of the excellence of the research funded, with 7 out of ten of the self-assessments saying that 'nearly all' or 'a

majority' is world-leading, while the others say there is not yet enough information to judge. The self-assessments are also very positive about the involvement of leading researchers.

A further, significant indicator of excellence can be found in the evaluations of research proposals, in which proposals are peer reviewed and classed according to three criteria: scientific excellence, quality of project management and potential impact. According to a special analysis undertaken at the request of the Expert Group, the mean score for 'scientific quality' is 4.4 out of 5 (minimum 4) and 13.1 out of 15 for the sum of the three criteria, far above the minimum of 10 specified in the programme rules. This implies that the effective threshold for a successful application is substantially above the minimum, which provides an objective measure (given that it is the verdict of peer reviewers) of the quality of proposals. These data also provide a signal to the research community that only high quality proposals will be funded and it is striking, as Table 3 shows, that the high mean scores are a feature of all thematic priority areas.

However, some of the other criticisms seem to be better founded. Many submissions to the Expert Group complain that topics under *Cooperation* may be too narrowly specified and suggest that a result of this narrowness may have been to deter industry participants. This prompts the question of whether a different balance could be achieved, with more weight given to more open topics. Another criticism levelled at cooperation projects is that they lack flexibility and do not give enough scope to develop the science once the project has been formally approved for funding, because the need to fulfil commitments to detailed deliverables means that the scope for amending the project work programme is limited.

**Table 3 Evaluation scores in *Cooperation***

| Priority Area | Signed Grant Agreements | Average Total Evaluation Score [Maximum = 15] | Average Evaluation Score for "scientific excellence" [Maximum = 5] |
|---|---|---|---|
| *Health* | 437 | 13.47 | 4.51 |
| *Food, Ag., Fish and Biotech.* | 196 | 13.62 | 4.57 |
| *IC Technologies* | 1,077 | 12.96 | 4.31 |
| *Nanosciences, Nanotech. & NMP* | 322 | 12.96 | 4.37 |
| *Energy* | 189 | 13.10 | 4.46 |
| *Environment (incl. Climate Change)* | 211 | 13.40 | 4.43 |
| *Transport (including Aeronautics)* | 275 | 12.64 | 4.24 |
| *Socio-econ. Sciences and Humanities* | 134 | 13.76 | 4.60 |
| *Space* | 48 | 12.73 | 4.24 |
| *Security* | 94 | 12.83 | 4.38 |
| *General Activities* | 20 | 12.08 | 4.25 |
| ***Total*** | **3004** | **13.11** | **4.39** |

Source: Special analysis for the Expert Group by services of DG RTD, European Commission.

The relatively low success rate (just under 20% in each year 2007-2009) has two implications. First, it is a measure of the attractiveness of the programme to the research community and of the intensity of competition for grants. But it also means that considerable research effort is dissipated in unsuccessful proposals. For researchers, especially the coordinator of a proposal, putting together a credible research proposal typically requires a substantially greater input than for nationally funded projects of comparable scale.

There is some evidence in the comments in the stakeholder consultation and from the opinions expressed to the Expert Group by project coordinators[26] that EU resources have created stronger European research communities through projects funded under *Cooperation*. Similarly, that FP may have stimulated inter-disciplinary research, witness the assertion by the Environment Advisory Group[27] that without it, environmental research would have been predominantly natural sciences.

The evidence suggests that industry has a rather ambivalent view of the specific programme *Cooperation*. On the one hand, it is an area where the data show that industry participates extensively, with more than five thousand SMEs as partners in projects funded so far in FP7. Moreover, industry participation in some *Cooperation* themes is substantial, reaching a quarter of the participation in certain themes. Thus, private-for-profit organisations represent 25.5% of total participants in Nanosciences etc., and 24.8% in Transport. On the other hand, industry participation has diminished overall and is surprisingly low in certain themes (see section 5.4 for further discussion). For these reasons, the Expert Group is not convinced that the innovation dimension is sufficiently prominent in some parts of *Cooperation*. Large companies are unlikely to support research when the risks cannot be calculated or where there is a large public good effect, and are, consequently, less likely to reorient their R&D plans in line with FP calls. However the 'structuring' effect being aimed at is more likely to manifest itself through publicly funded research institutes and universities.[28]

Large companies certainly participate in *Cooperation*, but the stakeholder consultation offers some telling insights into their attitudes towards it. Several large company respondents express dissatisfaction with the pre-competitive emphasis of *Cooperation* projects, with research agenda set by universities and/or research and technology organisations. However, the comments also reveal that a reason for the lack of involvement is that large companies are put off because, to quote one respondent, 'the transaction costs associated with the FP approach have grown completely out of proportion'. A statement from another large company is that 'bureaucracy linked to the coordination of a cooperation project is very high; consequently, most companies leave this role to University partners'. This risks becoming a form of 'Catch-22' in which large companies are reluctant to become fully engaged and to shape projects, but find that the research agenda do not fit their priorities and thus have insufficient incentives to become involved.

Gender equality has made some progress in certain thematic areas of *Cooperation*, but noticeably less in others and there are striking, if predictable differences across the thematic areas. As an illustration, the proportion of scientific contact persons who are women is between 10 and 15% for Energy, Security, Space and Transport, but reaches 27% for health and 32% for Social Sciences and Humanities.

---

[26] See also: AVEDAS AG., et al. (2009): Structuring effects of Community research. The impact of the RTD Framework Programme on network formation. Final report to the European Commission, April 2009.

[27] Submission to the Expert Group, July 2010.

[28] Interim Evaluation of the ICT Research in the Seventh Framework Programme: Catalysing European Competitiveness in a Globalising Wold. Evaluation Panel Report, June 2010.

### 3.1.1 Conclusions on *Cooperation*

The unique contribution of this specific programme to European research and, thus, to the development of the ERA has to be stressed. The Expert Group therefore concludes that collaborative research of the sort funded by the programme has a continuing role to play in EU research priorities. Quite simply, without it, the cross-border component of research would be diminished. For the smaller, or less well-connected, EU Member States, especially, *Cooperation* is an important vehicle for developing their potential, and involvement in collaboration projects provides visibility and prestige, both within their domestic setting and beyond, as well as generating the direct benefits of collaboration.

The specific programme lacks flexibility and one way forward may be to have scope for bottom-up proposals as well as the top-down ones derived from the major Work Programmes. Call topics could also be more broadly defined, less prescriptive on methods or approaches, and orientated towards the hoped-for outcomes, to allow the funded science to be responsive to changes in the field between when the Work Programme is finalised and projects are due to start.

The Expert Group also considers that the obligation at the contract negotiation stage to set out a detailed list of deliverables is too onerous. Research is inherently uncertain, and specifying too much at the outset inhibits flexibility in projects and deters researchers from pursuing promising new avenues or reacting to new challenges identified as the project unfolds. Having too many and too detailed deliverables also generates an unnecessary burden for project management. In the same vein, monitoring procedures should be less concerned with whether a deliverable has been produced (sometimes irrespective of its contribution to the quality of the research), and more whether it is of value to the research process. The Expert Group therefore concludes that the current requirement under FP7 for highly detailed specification of deliverables in advance does not achieve optimal outcomes and should either be revised, if legally feasible, or implemented more flexibly for calls launched in the remainder of FP7.

More trust should be placed in researchers to amend project work programmes and deliverables instead of sticking rigidly to plans established at the outset. In this regard, the Expert Group notes the groundswell of opinion articulated by the 'Trust Researchers' campaign. At the time of writing, 13,684 researchers had signed a petition calling for a significant reduction in bureaucratic demands and for greater trust to be vested in researchers.[29]

Disparities in success rates are striking throughout FP7 and pose a number of challenges, particularly in the specific programme *Cooperation*. Technical aspects apart, there are probably very different reasons for the variation in success rates. For example, low success rates might be explained by annual programmes having a broad definition of priorities (calling for many different types of projects), or by the emergence of new and vibrant research topics; while high success rates might be due to the novelty of some specific sub-programmes, poor communication of funding possibilities, or very narrow calls. These causes need to be properly diagnosed in order to be redressed, as over- or under-subscription indicates that there is a problem in the balance between resources and demand.[30]

New thinking is needed on how best to integrate industry into collaborative projects. Here the findings from the assessment of the impact of previous FPs produced by one of the supporting experts to this evaluation are illuminating. The study of innovation under FP5 and FP6 by

[29] http://www.trust-researchers.eu/index.php?file=home.php

[30] Further insights into the overall low success rates can be found in: Interim Evaluation of the ICT Research in the Seventh Framework Programme, op. cit.

Wolfgang Polt et al. shows that the impact on SMEs, especially, can be considerable in generating 'input' additionality in their research: in other words, they do more research. He finds, though, that unless commercialisation is prominent from the outset of a project, it is unlikely to be achieved, even if there are 'commercialisable' research findings. The SME impact assessment study confirms this finding: it reveals that as SMEs become more aware of the utility of R&D, they become more involved in networks and seek to boost their R&D capabilities.

A further finding from Polt's work is that there is little additionality from large enterprises, which could signal that FP support does not lead to more research – indicating a high level of 'deadweight' (public funding supporting activities that would have happened regardless). But it is important to recognise that large companies do not participate in such collaborative projects primarily for financial reasons (see section 5.4). Also, it has to be stressed that these findings derive from analysis of FP5 and FP6 and do not necessarily apply to FP7, although the fact that the modalities of *Cooperation* are similar (with the exception of the down-playing of Networks of Excellence) to previous FPs suggests that the pattern may be repeated.

For SMEs, the Expert Group notes that what is frequently most valuable is access to research findings rather than being involved as direct producers of research. If commercialisation of research is to be encouraged, more scope is needed for SMEs to be engaged in collaborative projects as the bridge between the pre-competitive research and the innovations that can contribute to competitiveness goals. This reasoning pleads for channels that enable SMEs in *Cooperation* projects to exploit the research with which they are associated. However, as Polt notes in his analysis, to give greater weight to innovation would require a paradigm shift in collaborative research which is predominantly orientated towards research production.

## 3.2 *People:* the Marie Curie Actions

Training and mobility of professionals in science and technology is crucial for the development of the ERA, and the Marie Curie actions, now under the specific programme *People*, have been important instruments to make Europe attractive to the best researchers and to implement the Community's career development policy.[31] *People* has been implemented through a coherent set of actions that aim at increasing the quality of human resources for research in Europe, enhancing industry-academia cooperation, supporting research careers for the young, for female researchers and for households with young families, and spreading good practices in the recruitment and employment of researchers. It is noteworthy that the Marie Curie actions, through a bottom-up approach with no pre-defined themes, have promoted excellence and contributed to internationalisation efforts in Europe. In strategic terms, the Marie Curie actions are the most international initiatives in FP7.

In FP7, the Marie Curie actions represent continuity from previous Framework Programmes yet have evolved into a set of new instruments. Five actions have been of particular importance:

- The individual fellowships (IxF)
- Initial Training Networks (ITN)
- Industry-Academia Pathways and Partnership (IAPP)
- COFUND
- International Staff Exchange Scheme (IRSES)

[31] European Commission (2005): The European Charter for Researchers. The Code of Conduct for the Recruitment of Researchers. Luxembourg: Office for Official Publications of the European Communities, 2005.

In the period 2007-2009, 30 calls were launched and concluded in *People*, resulting in 4,260 projects retained for funding. During that period more than 3,000 individual researchers have benefited from FP7 financial support aimed at enhancing their mobility inside and outside Europe, while nearly 300 ITN and IAPP networks have been selected for funding that has given training to more than 4,500 researchers. The success rate was on average 32.2%, but showed great divergence among the action, ranging from 8% in ITN to more than 60% in IRSES and COFUND.[32]

In administrative terms, the Marie Curie actions have been subject to a number of changes which, at least in some respects, have been disruptive. At the policy level, they were transferred in May 2010 to the Directorate General for Education and Culture, from DG RTD. Implementation of *People* is now handled by the Research Executive Agency (REA) which deals with all the associated administrative tasks, and the processing of calls, evaluations and subsequent management of funded projects. Inevitably, there have been teething troubles in the transition, partly because of IT difficulties and partly because of the need for new staff to become familiar with the systems. There have also been cost savings which are welcome, and the impression formed by the Expert Group is that the division between policy-making in the Commission and implementation by the Agency is settling down. In this regard, it is important to note that the REA only obtained full autonomy in the summer of 2009, more than two years into FP7.

### 3.2.1 Conclusions on *People* specific programme

The Expert Group concludes that the *People* programme seems to have been successful so far. The Marie Curie actions are well structured and balanced, and have a reasonable amount of flexibility to respond to societal demand. Instruments are broad and inclusive, supporting diverse categories of applicants – not least industry and SMEs. The Expert Group acknowledges that the Marie Curie Actions set a valuable bench-mark for the working conditions and employment standards of EU-researchers. The competition for the Initial Training Networks has been tough, with success rates ranging from 8.3% in 2007 to 11.9% in the 2008 call. The low success rate for ITN may in part be explained by the fact that this is a very broad and open type of instrument, but it also reflects its high standing.

The COFUND action was introduced in FP7 and aims to structure the ERA by aligning national resources for post-doctoral researchers. As such, COFUND enables Member States to influence the fellowship programme design, but also sets standards of employment and open recruitment for all EU researchers. IRSES is a small sub-programme set up to facilitate the exchange of research staff between Europe and countries covered by the Neighbourhood policy or by an S&T agreement. Evidence of the efficiency of COFUND and IRSES is limited, and the progress of these actions should be monitored closely.

The Expert Group expects the administrative side of *People* to improve as experience accumulates, notably inside the Research Executive Agency. For the second half of FP7, the Expert Group would welcome a more coherent and straightforward approach within *People*, streamlining procedures within existing actions and avoiding introducing any more novelties.

## 3.3 Research Infrastructures in *Capacities*

The specific programme *Capacities* comprises support for SMEs (discussed in section 5) and for Research Infrastructures (RIs). The latter are widely recognised as being necessary for developing an effective research and technology system, and as a vital underpinning for the Knowledge Triangle. RIs are defined comprehensively in FP7 to include major scientific

[32] Third FP7 Monitoring Report., op cit.

equipment, scientific collections, archives, surveys, ICT-based e-infrastructures, and other research-enabling facilities and resources. RIs are costly and need to be of a sufficient scale if they are to be viable, so that there is often a compelling logic for EU level funding for some of the more costly infrastructures.

An important development at EU level was the creation in 2002 of the European Strategy Forum for Research Infrastructures (ESFRI) and its impact has been felt through the 'roadmaps' it has since developed to guide investment in RIs as part of the push to achieve ERA goals. ESFRI has also encouraged the establishment of RIs of pan-European interest, which have the potential to become global. FP7 has been a key instrument for implementing the roadmaps and it is clear from 'Commitment 5' in the Commission communication on Innovation Union that further enhancement of RIs is seen as an important ingredient in stepping-up innovation in the EU. The European Research Infrastructure Consortium (ERIC) was established as a legal framework to enable the joint establishment and operation of RIs involving at least three Member States, and has been important in facilitating the engagement of Member States in the ESFRI process.

From limited resources in the Second Framework Programme, funding for RIs has grown rapidly, doubling between FP5 and FP6, while spending in the first four years of FP7 is set to be more than double that of the whole of FP6. The budget for RIs within FP7 was set at €1,715 million for 2007-2013 and the average number of RI projects funded up to July 2010 was 229, of which 137 are managed by DG RTD and 92 by DG INFSO, notably e-Infrastructures such as the GÉANT research network and the research-Grids infrastructure which connects over 40 million researchers in 34 European counties and links to many other countries worldwide.

For industry, RIs have a threefold benefit. First, they offer market opportunities for industry as a supplier, often with the complementary benefit of providing a testing-ground for innovative products and services. The report by Costas Fotakis, a supporting expert to this evaluation[33] quotes as evidence on this latter aspect that nearly 'two out of three companies have reported that they have been able to move into new markets due to their activities as product suppliers to RIs'. Second, there has been some increase in FP7, albeit from a very low base in FP6, in industry making use of RIs, with initial data showing that 7% of RI users were from industry. Third, industry can itself provide infrastructure from which others benefit, an example being the European Strategic Wind Tunnels Improved Research Potential project, which is an Integrated Infrastructure Initiative (I3). The Expert Group considers that these different industry-RI links are an important, if possibly under-exploited channel for integrating industry into the FP. In particular, they can offer a means of enhancing demand-driven innovation.[34]

RIs have a significant role in the production of well-trained researchers, which is seen as highly important, especially by industry. A related benefit of RIs is to provide opportunities to train younger researchers and to offer more experienced researchers and research personnel in industry access to facilities that would not otherwise be affordable. According to RI users in FP6 projects, approximately 90% of researchers would not have been able to carry out their work without RI support. This is a classic example of the public goods rationale for research funding. The Expert Group observes that although the sheer numbers of scientists taking advantage of RIs is large and growing, more could be done to integrate the human capital and

[33] Fotakis, C. (2010): Analyses of FP7 supported infrastructure initiatives in the context of the European Research Area (Expert analysis in support of the Interim Evaluation of FP7).

[34] For more details see: Fotakis (2010), op.cit.

infrastructure strands of funding. Quite simply, it costs money for researchers to travel to RIs and, in some cases, to pay for access.

An important aspect of RIs is openness to trans-national use, as this is crucial to their European added value, and evidence from FP6 shows that the supported infrastructures were used by researchers from all Member States.[35] The budget for trans-national access did not increase between FP6 and FP7 and this appears to have inhibited the use of RIs. As a result, potential enhancements of human capital may fall short if complementary funding to facilitate access is not available. The scope for third country nationals to make use of RIs is subject to similar constraints, and may also be reduced by rules governing access. However, e-Infrastructures have a different logic that can overcome this constraint. They provide remote access to scientific resources – from telescopes and lab experiments to supercomputers and databases – and enable global collaborations, giving rise to virtual research communities.

### 3.3.1 Conclusions on Research Infrastructures

Although all the main themes of FP research have secured funding for RIs, the current level of funding may be inadequate for the full exploitation of RIs by European scientists. Despite the efforts to create an enabling legal framework through ERIC, there are continuing obstacles to exploitation of the significant investments made in RIs. Moreover, national and European investments have to be coordinated and optimised to the benefit of infrastructures. These are, largely, problems of coherence in research policy and of flexibility in administration, both of which ought to be capable of resolution. The Expert Group therefore concludes that there should be a concerted effort to find viable solutions, and thus to boost the impact of RIs.

Plainly, though, it will not be easy to fund all the projects in the ESFRI roadmap, especially in the current economic situation, so that it is important for FP7 funding (including the RSFF – see section 4.2) to work with other funding sources. For example, resources from the Structural Funds that have been allocated to research infrastructures could be a significant factor at local and regional level, in particular in the New Member States. More emphasis on regional RIs for pooling resources and developing joint strategies and joint planning could contribute to resolving major societal and economic challenges at regional level.

More generally, the Expert Group concludes that RIs are a good example of added value at European level, but that they are not yet having as great an impact on ERA as they could. In the latter years of FP7, a priority should be to boost RIs where possible and to ensure that the investments already made in them are used to maximum effect. This reasoning also suggests that more emphasis should be given in FP8 to the creation and exploitation of RIs, not least to foster Innovation Union and Digital Agenda goals.

[35] Fotakis (2010), op.cit.

# 4 Novel measures in FP7

Several novel approaches to funding were introduced in FP7 that manifestly change the topography of EU research funding. The specific programme *Ideas*, with the advent of the European Research Council, is clearly a significant new direction and is highlighted in the Communication on Innovation Union which calls for reinforcement of the European Research Council. Since the earliest Framework Programmes, the involvement of industry has been a key feature. While the bulk of industry involvement has been in collaborative projects now under the specific programme *Cooperation*, two new instruments - the Risk Sharing Finance Facility (under *Capacities*) and the Joint Technology Initiatives (part of *Cooperation*) help to strengthen alliances between FP7 and industry. Others have sought to forge links and increase coordination between national financing and the FP (ERA Net Plus, Article 185 projects and Joint Programming). This third group of instruments reflects the need for concerted efforts to address the 'Grand Challenges' facing European societies, for which improved collaboration and coordination between different policies, funding schemes, instruments, and levels (national, regional, European) is required.

## 4.1 European Research Council

The FP7 included for the first time a Europe-wide mechanism for funding of frontier research, through which one of the key weaknesses of the European Research Area could be addressed. Frontier research is regarded as an important driver of long-run growth, so that the ERC represents an important departure. The specific programme *Ideas*, operating through the European Research Council (ERC), has been allocated 15% of the FP budget and is open to any ideas put forward by researchers in a bottom-up procedure. The mandate for the ERC is ambitious, with a mission to 'reinforce excellence, dynamism and creativity […] and improve the attractiveness of Europe for the best investigator driven research projects'.

One very important feature of the new ERC is that it represents a new interpretation of 'European added value' and the 'subsidiarity' principle, supporting research projects carried out by *individual* teams, which are proposed by researchers on *subjects of their choice*, covering the *whole field of knowledge*, including social sciences and humanities. A second important feature relates to implementation. The ERC (budget = €7.5 billion for 2007-2013) is made up of an independent scientific council responsible for academic standards and the European Research Council Executive Agency acting under the Commission's control, but scientifically and operationally autonomous from it, responsible for implementation. The condition requiring the research work to be undertaken in Europe also provides opportunities to attract world class non-EU researchers as well as providing a magnet for world-class European researchers working in the US and elsewhere to come back.

The first six calls, three each for 'starting grants' (for recently qualified researchers) and 'advanced grants' (for senior staff) attracted 20,302 applications. Four of these calls have been completed, resulting in decisions to fund 1,071 projects out of 15,420 applications received in these calls, an overall success rate of 6.9%.[36] The low success rate stems partly from the fact that the first starting grants call in 2007 attracted 8,794 valid applications from which the budget allowed only some 300 to be funded, a success rate of just 3.3%. Success rates have risen in subsequent calls and are markedly higher for the advanced grants. It seems clear that the ERC is attracting applications of high quality, as some 56% of the total number

[36] See *Ideas* Programmes (ERC): Early Signs of Wide-Ranging Impact. Brussels, June 2010.

of applications was evaluated as above the threshold set by the evaluation criteria.[37] An important feature of the funded projects is the relatively high concentration geographically, with UK, France, and Germany being by a good margin on top (and obtaining 50% of all grants between them), and Switzerland, Netherlands, Italy, Spain and Israel as a second group. There are also signs that researchers based at smaller institutions in these countries are highly competitive. Another feature, according to an analysis by the ERC Executive Agency, is that a significant share of all applicants have been working in the US, indicating that the programme is having an effect on attracting top researchers back to Europe.[38] There is a also a training element in ERC advanced grants, with preliminary analysis of the financial reports revealing that advanced grant teams typically consist of two doctoral students and two post-docs in addition to the principal investigator.

The available evidence supports the contention that the *Ideas* programme is a very successful initiative. In the NCP survey, 68.2% of respondents rated the ERC as generally well or very well designed and 61.6% of the respondents replied that the ERC has been generally well or very well implemented. Moreover, the tone of comments in both the NCP survey and the stakeholder consultation tended to stress that the ERC is a major breakthrough, stimulating ground-breaking research.

There is also some evidence[39] to suggest that the ERC is leveraging different research strengths through its competitive funding and is attracting and retaining outstanding researchers to Europe. Some of the responses to the stakeholder consultation and other anecdotal evidence suggest that a level of compatibility (even calibration) has developed between the ERC and national research councils as the latter increasingly 'accept' the ERC evaluation results as a basis for awarding grants to highly-rated researchers who fail to be funded by ERC.

There are, plainly, dangers from the low success rates in response to ERC calls in deterring applicants and de-motivating reviewers when so many high quality projects remain unfunded, suggesting that the budget available, though sizeable, should be increased. However, there is already a substantial increase in funding in the pipeline for the ERC in the remaining period of FP7[40] and therefore reviewing the funding share should be considered for FP8.

The Expert group commends the success of the ERC which has rapidly gained recognition from the research community, as well as policy makers throughout Europe. There is, nevertheless, a need to maintain the balance between bottom-up and top-down instruments as defined in the FP7 legal basis. The Expert Group notes that, in 2009, the ERC Scientific Council established a Working Group on Relations with Industry. The Working Group has already consulted with several stakeholders in the private sector, including the European Industrial Research Management Association (EIRMA), in order to explore the scope for increased participation of private sector researchers. This sort of initiative could be taken further to ensure that important ideas and scientific breakthroughs supported through the ERC are accommodated and disseminated.

[37] ERC has also had the accolade of researchers funded by it winning the 2010 Nobel prize for physics.

[38] However, the ERC programme does not appear to have attracted many researchers from the BRICS countries to Europe.

[39] *Ideas* Programme (ERC): Early Signs of Wide-Ranging Impacts, op. cit.

[40] Due to the significant budgetary increase after 2008, both the ERC Advanced Grant 2009 call and the recently concluded ERC Starting Grant call of 2010 had a success rate of around15%.

## 4.2 Risk Sharing Finance Facility

Launched at the beginning of FP7 (2007), the Risk Sharing Finance Facility (RSFF) is a loan-based instrument to complement more traditional grant schemes at European level. Through the RSFF, which is supported by FP7 budget resources (up to €1 billion) as well as the EIB's own resources (up to €1 billion) to cover potential losses, the EIB and its financial intermediaries will be able to provide higher-risk loan finance of up to €10 billion for RDI investments during the period 2007-2010. Projects funded by the RSFF must meet the quality criteria stipulated by the EIB, including creditworthiness, financial viability and techno-economic risks. As of September 2010, projects worth a total of €8.1 billion have been approved, and include participants in 18 Member States and 2 associated countries.

In compliance with the requirements of the FP7[41] and of its specific programmes *Cooperation* and *Capacities*[42] (both contributing to the RSFF budget), the RSFF's implementation has been subject to an Interim Evaluation conducted by a group of independent experts. This evaluation concludes that it has been a success, both in quantitative and qualitative terms, notably having reached 65% of its targets at mid-term instead of the expected 50%.[43] It is an innovative, demand-driven instrument which has dramatically expanded European financing for RTDI and also helped firms hit by the credit squeeze of the last two years. Furthermore, the RSFF demonstrates the value of collaboration between, on one side, an organisation with technical and sectorial expertise and risk management capability, and on the other one (the Commission) able to bring together interested RTDI parties in the context of European Technology Platforms and Joint Technology Initiatives, and also in the context of the Strategic Energy Technology plan. According to the RSFF evaluation, the EIB has shown its ability to adapt and refine the instrument in the course of its first three years by developing new financing products to meet the requirements of so-called 'pathfinder' projects.

The evaluation also praises the efficient implementation of the RSFF. The Expert Group welcomes these findings and supports the pledge to release the second tranche of FP7 funding to the RSFF. However, it notes that it can be hard to demonstrate that the funding allocated to large companies genuinely leads to additional capacity building over and above what large companies would finance anyway, and the Group calls for careful examination of whether the RSFF results in higher investment. The Expert Group also notes that loan funding could potentially be problematic for non-profit research organisations (notably universities and RTOs) that cannot generate the surpluses needed to service loans. For SMEs, too, it is not obvious that the RSFF offers much, and to the extent that large and mid-cap companies obtain access to cheaper loans, competitive imperatives would suggest that SMEs – where investing in research is a more pressing concern – should be offered similar access to such conditions. This could imply a need for a parallel SME lending facility.

## 4.3 Joint Technology Initiatives

Joint Technology Initiatives (JTIs) are public-private partnerships at European level in the field of industrial research. JTIs were introduced in FP7 as a means to implement the Strategic Research Agendas (SRAs) of a selected number of European Technology Platforms (ETPs) for which the scale and scope of the objectives meant that more intensive co-ordination was needed. The five JTIs introduced in FP7 were Innovative Medicine Initiative (IMI) in

[41] Decision 1982/2006/EC of the European Parliament and of the Council, 18 December 2006, Annex II.

[42] Decision 2006/974/EC of the Council, 19 December 2006, Annex III.

[43] Mid-term evaluation of the Risk-Sharing Financial Facility (RSFF). Final Draft of the Group of Independent Experts (2010).

pharmaceutical development, Clean Sky in the aeronautics industry, ARTEMIS in embedded systems, ENIAC in Nanoelectronics, and the Hydrogen and Fuel Cells Initiative (FCH). The JTIs were designed to go beyond traditional R&D funding and include measures to build an innovation 'eco-system' in each of its technological fields, including standards promotion, identification of future skill requirements etc. However, the JTIs are not a homogenous set of instruments. On the contrary, the Commission states that when preparing the JTIs, 'it has not followed a "one size fits all" approach because of the varied nature of the technological challenges, the different type of stakeholder relations and the need for tailored financial engineering arrangements'.[44] Around 10% of the specific programme *Cooperation* budget has been allocated to JTIs.

At present only two of the five JTIs, ARTEMIS and ENIAC, have been independently evaluated.[45] In addition, the JTI Sherpa report from January 2010 takes stock of the first overall experiences with setting up Joint Technology Initiatives.[46] Based on the evidence presented in the evaluation of ARTEMIS and ENIAC, and the Sherpa report, as well as findings from the stakeholder consultations, the Expert group finds that the JTIs:

- Have been challenging and resource-intensive to set up, but have managed to establish themselves as autonomous bodies capable of ensuring the implementation of considerable amounts of funding for R&D;
- Have focused and aligned key actors in their respective areas, serving as a support to develop coherent sectorial strategies. In the case of ARTEMIS and ENIAC, these aligning processes have involved new actors, including SMEs that have previously not taken part in strategic discussions at European level;
- Have attracted wide-spread criticism of the complexity of rules and regulations adopted, with each separate initiative introducing its own legal and administrative framework;
- Must ensure competitive funding rates and sufficient allowance for overhead costs to attract excellence;
- In the future must be built on a genuine partnership between the public and private actors, based on mutual trust and confidence.

ARTEMIS and ENIAC are based on a tripartite funding model, involving the Commission, Member States and industry. For this model to be effective, it is absolutely essential that Member States accept and fulfil the requirements of the Council Regulations establishing the JTIs.[47] If the JTIs are to become attractive funding instruments, it is fundamental that Member States agree to multi-annual, binding budgetary commitments. The evaluation of ARTEMIS and ENIAC shows that the European strategic objectives criteria of these JTIs were, at times, set aside, allowing national interests and priorities to dominate. The Expert Group recommends that all JTIs are monitored closely in the second half of FP7 to make sure that they adhere properly to the agreed principles.

---

[44] About the JTIs see: http://cordis.europa.eu/fp7/jtis/about-jti_en.html

[45] First Interim Evaluation of the ARTEMIS and ENIAC Joint Technology Initiatives. Evaluation Panel Report, July 2010.

[46] JTI Sherpas Group (2010): Designing together the 'ideal house' for public-private partnerships in European research. January 2010.

[47] Council Regulation No. 72/2008 establishes the ENIAC Joint Undertaking, and Council Regulation No. 74/2008 of 20 December 2007 establishes the ARTEMIS Joint Undertaking.

## 4.4 Coordination of public R&D investments in ERA

Several novel measures have been introduced to bolster the coordination of EU level and national research efforts. With the development of ERA from 2000, and its reinforcement through the Ljubljana process in 2008, coordination of national R&D spending and programmes came on the agenda. Despite the projected increase in spending in the latter years of FP7, national budgets will be the main source of funding for the foreseeable future. Hence a better coordination of national programmes and resources could have a great impact on the overall efficacy of European R&D efforts.

### 4.4.1 ERA-NETs and ERA-NET Plus

FP6 initiated ERA-NETs as an instrument to stimulate better coordination among funding institutions within a number of thematic fields, by linking national research programmes. Many of these were also international, aiming at coordinating national efforts of cooperation vis-à-vis key international partners such as China. The scheme continued in FP7, and the number of ERA-NETs is now approaching 120, with a total public funding commitment of about €2 billion. While ERA-NETs in some cases have contributed to the creation of Joint Programming Initiatives (JPIs), these two should not be mixed up, as ERA-NETs are an FP instrument and Joint Programming is a Member State led process.

To complement ERA-NETs, there was the introduction of a new mechanism in FP7, the ERA-NET Plus. In contrast to ERA-NETs for which funding is limited to coordination costs and to Article 185 Initiatives, which involve a full integration of national programmes, ERA-NET Plus facilitates joint calls through topping up the joint national funding with FP7 funds (33% of the joint call). Hence the ERA-NET Plus represents a significant incentive to develop trans-national funding initiatives that attract additional FP funds available for this purpose. Nine ERA-NET Plus proposals have been approved, involving 140 funding partners, with a total trans-national budget of €232 million and a FP contribution of €67.5 million.[48]

The main reason for using ERA-NET Plus is to allow national funding agencies to work together to support research of mutual interest, while avoiding unnecessary duplication. The evidence show that ERA-NETs play a significant role in facilitating the research planning that led to the development of individual ERA-NET Plus actions. The implementation of this scheme has encountered teething problems related to contract negotiation and related procedures. These are being addressed in the light of the implementation of the first ERA-NET Plus actions. However, some complexity remains with regard to the funding process and this can slow the payment schedule for research projects.

Evaluation of ERA-NET Plus finds that it is contributing to pooling national resources, succeeding in bringing together efforts to meet joint challenges, and it has acted in some cases as a bridging mechanism between ERA-NETs and Article 185 initiatives. It has been met with interest by the research community, with 6000 teams having declared an interest in participating and 2000 research groups invited to submit detailed proposals. Nevertheless, the role of the ERA-NET Plus is not to build long-term strategic networks; rather its potential effectiveness lies in providing a relatively easy-to-use tool to support already mature networks in implementing and funding their strategic research agendas.[49]

The Expert Group concludes that the ERA-NET Plus instrument has the potential to have a positive impact on ERA and the coordination of national efforts and it could play an enhanced role in the future in the context of the Joint Programming Initiatives.

---

[48] ERA-NETs on stage 2010: Final Report. Annual ERA-NET Event, 23-24 March 2010.

[49] ERA-NET Plus Review 2010. Final Report of the Review Panel, June 2010.

### 4.4.2 Article 185

Article 185 of the Treaty on the functioning of the European Union (TFEU), provides a legal basis for the Union to participate in research and development programmes of the Member States, to help the coordination of R&D in Europe and support a more coherent use of resources. Despite its similarities to ERA-NET Plus, it is more limited in numbers and, crucially, not implemented through FP7 calls, although it may build on ERA-NETs or ERA-NETs Plus, based on specific criteria.

Rather than responding to calls for proposals, an initiative for such measures is formally submitted by the European Commission for a decision of the Council of Ministers and the European Parliament, thus demanding a clear political mandate and sufficient scope for its implementation. Four have been adopted so far during FP7:

- Ambient Assisted Living (AAL) to enhance the quality of life of elderly and strengthen the industrial base for related industries through the use of ICT
- European Metrology Research Programme (EMRP)
- BONUS Baltic Sea, supporting the European Strategy for Marine and Maritime Research
- Eurostars, for development projects in any field, with specific attention to research-intensive SMEs.

An Interim Evaluation of the AAL concludes that it has made progress towards its objectives and that its overall direction is widely seen as positive. The evaluation report adds that it is a remarkable achievement that, in just a few years, the countries supporting the AAL programme have engaged in such close cooperation. It is strong evidence of their interest that they have increased their financial contributions significantly beyond the minimum required. It has also achieved a high level of SME participation at about 40% compared with less than 20% in the first call of the FP7 ICT & Ageing Programme. The programme should achieve its short-term objectives, provided a number of shortcomings are addressed. For instance, the evaluation finds that the virtual common pot approach taken in AAL is inflexible from the perspective of the research teams when it comes to working with partners whose national funding is exhausted. Moreover, the evaluation notes that it is a problem in AAL that some types of participants are seen as ineligible for funding in certain countries and eligible in others.[50] As with the JTIs in the ICT field, the future success of the Article 185 Initiatives will depend heavily on Member State commitment.

Although the experience to date is limited, a tentative conclusion is that Article 185's potential can be reinforced by putting in place complementary measures to address key barriers to exploitation, such as interoperability and standards, financing for innovation, market fragmentation, user acceptance, ethics, social and business innovation and impact. The Expert Group stresses the importance of employing excellence criteria similar to those applied throughout FP7 for Article 185 proposal selections.

### 4.4.3 Joint Programming

The above measures aimed at stimulating the coordination of research in Europe are closely related to the ERA initiative referred to as Joint Programming. To enhance the response to the 'Grand Challenges' of our time, the European Council of March 2008 called upon the Commission and the Member States to explore the potential of joint programming. The Commission made proposals to launch such a process in July 2008 in a Communication called

[50] Interim Evaluation of the Ambient Assisted Living Joint Programme. Independent Panel Draft Report, September 2010.

'Towards Joint Programming in Research: Working together to tackle common challenges more effectively' (COM (2008) 468). While Joint Programming is not an FP7 instrument, the Expert Group sees it as key to the success and influence of coordination measures in FP7 such as ERA-NETs and ERA-NET Plus. A High Level Group on Joint Programming ('Groupe de Programmation Conjointe' or GPC) consisting of representatives of Member States and of the European Commission, and assisted by the Council Secretariat, has been set-up to implement the Joint Programming Process by identifying JPI themes and developing voluntary guidelines for Framework Conditions. Before the work of the GPC started the Member States agreed on a pilot JPI dealing with Neurodegenerative Diseases (including Alzheimer's).

Taking account of priorities set by the Council, a first wave of some 20 themes for JPIs was put forward by 10 countries and three were adopted in April 2010 by the Commission, and have since been approved, addressing:

- Agriculture, Food Security and Climate Change;
- A Healthy Diet for a Healthy Life;
- Cultural Heritage and Global Change- a new Challenge for Europe.

Six new themes for a second wave of JPIs are in the pipeline:

- The microbial challenge - An emerging threat to human health;
- Connecting Climate Knowledge for Europe (Clik'EU);
- More Years, Better Lives - The Potential and Challenges of Demographic Change;
- Urban Europe - Global Challenges, Local Solutions;
- Water Challenges for a Changing World;
- Healthy and Productive Seas and Oceans.

It is far too early to judge whether the JPIs will change the European landscape in their field of research or if JPIs make it possible to address grand societal challenges efficiently. The success of those already launched will largely depend on the commitment of the participating countries as well as an adequate governance structure which generates trust, a shared common vision and a strategic research agenda. It is, however, clear that Member States have shown a considerable interest in participating in the various JPIs, but what that will mean in terms of financial commitment remains to be seen. Even though the starting-point for Joint Programming is cooperation between Member States, the links to various initiatives under FP7 (such as ERA-NETs, ERA-NET Plus, Article 185 cooperation, and the forthcoming Innovation Partnerships) need to be clarified. With the adoption of the Lisbon Treaty, new competences have been given to the Union, which include carrying out actions on Joint Programming (Articles 181, 182.5 and 292). Therefore, the enhanced role of the EU institutions on this matter is now defined by the Treaties. An implication is that, in the rest of FP7, as well as in FP8 (especially in the light of 'Innovation Union' imperatives), the role of the Commission may have to be revisited.

### 4.4.4 Conclusions on coordinating instruments

The proliferation of instruments has increased the complexity of developing and implementing the ERA, but it also provides a suite of tools that can be used in a strategic way to advance the vision of ERA. The Expert Group considers that efforts should be made to reduce the complexity of the current landscape of coordination measures and to improve their design in order to allow for the optimisation and full exploitation of their potential synergies. Equally, it is important to stress that increased cooperation between the Member State and EU levels, with pooling of resources, should not replace the existing Community efforts and

funding in the area of JPIs. Research within the FP should be a complement to national research activities and should concentrate on projects that cannot be implemented at a national level, supplementing the common pot funding of national programmes.

The Expert Group also fears that that *simplification* measures implemented in the 'FP7 core' will be of limited value if additional instruments, each with their own specific rules and regulations, keep being introduced. In view of FP8, there could be a one-to-one-principle by which a new measure can be launched only if an equivalent one is removed from the portfolio.

Caution is also needed if and when administrative bodies to manage new instruments or programmes are set up. Experience suggests that creating entirely novel structures and rules for each new instrument or sub-instrument entails starting intricate and lengthy processes. In FP7, this proved to be problematic in the case of the JTIs and Article 185 Initiatives, and there is concern among the stakeholders that the first JPI on Neurodegenerative diseases will develop in a similar way. Outsourcing implementation to an existing and already well-functioning body, such as Eureka in the case of Eurostars or EIB in the case of RSFF, appears to be a better solution, at least in the short-term.

The Expert Group notes with interest that a pilot Innovation Partnership on 'healthy ageing' is on the agenda for endorsement by the European Council at its December 2010 meeting. It will present an opportunity to ascertain if it is possible to build on existing common efforts – such as the Joint Programming for Neurodegenerative Diseases or the Ambient Assisted Living initiative – to create an Innovation Partnership at EU level.

# 5 Participation patterns and implementation

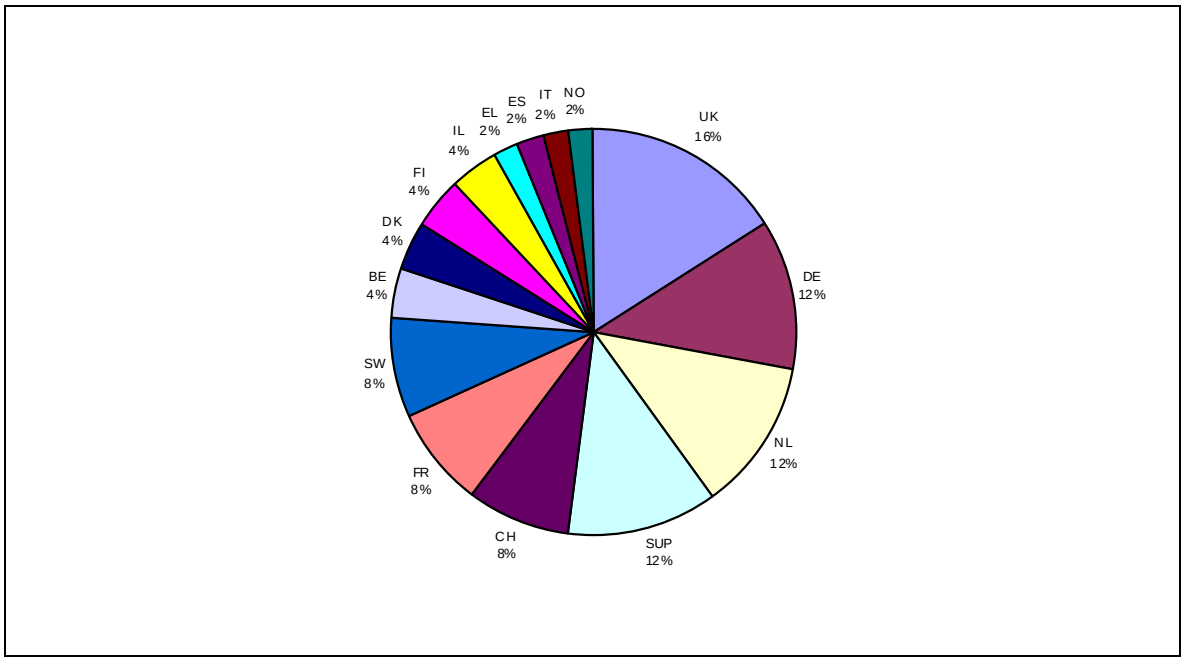
A programme as vast and complex as FP7 inevitably has to contend with a variety of challenges, whether affecting different goals or purely administrative in nature. This section of the report scrutinises a range of cross-cutting topics considered by the Expert Group to be germane to an appraisal of the implementation of the Framework Programme, highlighting aspects that deserve attention.

Respondents to the self-assessment are reasonably positive about the efficiency of the programme, scoring the FP at three out of four for the systems and procedures and giving it top marks for clarity and transparency. Most claim that the programme has been able to adapt to changing needs and none ticked the box for 'change is too difficult'. There has been progress on gender equality compared with FP6, but the overall message is that this remains a problem. From the perspective of the ERA, a less heartening response is that the benefits of FP7 research are only expected to continue in a minority of cases without further EU funding.

## 5.1 Universities and Research and Technology Organisations

Universities and Research and Technology Organisations (RTOs) have long been the principal beneficiaries of FP funding. Their position has, if anything, been reinforced by the advent of the ERC, nearly all the grants from which go to scientists attached to these bodies. Moreover, there can be little doubt that FP7 attracts the top EU researchers from universities and RTOs. The list of organisations that have obtained the largest amounts of funding from FP7 (see Appendix 1, Table 1) can be read as a *Who's Who* of European research quality.

**Figure 4 Distribution by country of top 50 recipients of FP7 funding [51]**




Source: Commission data

Note: the label 'SUP' refers to organisations with a pan-European remit

[51] In some cases, a leading recipient, such as the French CNRS is an umbrella organisation that covers a vast range of geographically separate research units.

But as Figure 4 shows, the leading recipients are based in a relatively small number of Member States and associated countries, prompting questions about whether this concentration is in the interests of Europe and consistent with ERA objectives. Conspicuously, there are no organisations based in EU12 Member States in the top 50 list.

Together, the top 50 recipients secured around a quarter of FP funding, the corollary of which is that three quarters is spread among the more than 14,000 other recipient organisations. This suggests that research funding is distributed in a predictable statistical way, but also mutes the often heard assertion that FP funding is exclusively for the big names.

The self-assessments by the Commission services responsible for different components of FP7 provide an overview of the quality of research, making that clear that the Framework Programme is attractive to leading researchers in universities and RTOs. Even allowing for some understandable inclination to accentuate the positive, these assessments reveal that the great bulk of funded research is world-leading and is expected to have a significant scientific impact. Most of the objectives in specific programmes are being met, but the median answer is that both the total funding and its distribution are such that not all areas have been developed in a satisfactory manner. Three quarters of the respondents state that their programmes have attracted top researchers and the remaining quarter report good coverage with only a few imbalances.

Anecdotal evidence provided by scientists themselves and the responses to the stakeholder consultation also signal that the research funded by FP7 attracts the best researchers. This positive verdict flows from observations across a wide variety of disciplines, in both pure and applied sciences, as well as in a broad spectrum of FP7 programmes.

However, there is manifestly disquiet among research performers about the level and modalities of research funding. Respondents to the stakeholder consultation are evenly split between those who believe that total FP7 funding is sufficient and those who disagree. Universities and RTOs are, however, adamant that the full economic cost of research is not met by FP funding even though the arrangements under FP7 have undoubtedly shifted in their favour compared with earlier Framework Programmes. EARTO, the body that represents RTOs, states that 'the full economic cost profiles of RTOs, universities, large enterprises, SMEs etc., vary considerably – within as well as between those categories.[52] Consequently a single formula cannot fit all performers of research because they face differing costs for, especially, equipment and facilities, with a range for RTOs from 60% to over 200%. Overhead rates for JTIs are a particular concern because they fall well short of the real costs of the research performers.

Because of the intensity of the competition for funding, not all applications from excellent researchers are funded, an outcome that will risk discouraging future proposals. It is reassuring that the research funded by FP7 can be successful, since it is effectively a good way to attract future researchers. But what remains a strong motivation for universities and RTOs is the scale of funding they can receive within a collaborative project (which implies more overall funding is needed) and also the freedom researchers may have to change plans if the results are not exactly as expected (which calls for some flexibility, as well as risk acceptance). Another necessity in order to nurture and sustain high quality research is a certain amount of continuity in funding for research that proves valuable, provided that it continues to satisfy excellence criteria and secures approval in peer reviews.

[52] EARTO response to the Commission Communication on simplifying the implementation of the research framework programmes. Brussels, 2010.

## 5.2 Gender issues and female participation rates

In 1999, the Commission adopted a Communication[53] which included a coherent approach towards promoting women in research. The objective was to achieve at least 40% representation of women in Marie Curie fellowships, advisory groups and other entities. This was later extended to include projects funded from the FP. The 40% target remained in place for FP6 and now for FP7. Bearing in mind that the overall percentage of women researchers in Europe is no more than 30%, the target set in the Communication cannot plausibly be reached unless the Member States take action to increase the number of female researchers. The base of female researchers is, however, evolving as a new generation enters the labour market. Recent data suggest that 45% of PhD graduates in 2006 were women,[54] so that the flow of women into research positions will gradually increase the stock of female researchers, provided that Member States provide sufficient support.

The Expert Group notes the Commission's efforts in FP7, as in previous FPs, to promote a better gender balance in FP7. The Group stresses the importance of continuing with these initiatives, but also stresses that without robust policies at the Member State level to promote female researchers, the FP alone cannot succeed. The Group also notes that reporting on female participation is one of the indicators used by the Commission in its revised system of annual monitoring of FP implementation which began at the start of FP7.

### 5.2.1 Female participation in expert groups and committees

There has been a significant development in female participation since the launch of the Communication and the start of FP5.[55] The most noticeable improvement has been for those target entities where the Commission itself has a strong influence: there has been a steady increase in female participation in evaluation panels, expert databases, advisory groups and Programme Committees, typically increasing from 10% in FP4 (in the case of experts) to 25 to 35% in FP7 (2009). The ERC Scientific Council had 27% women in 2009. Female representation in the top scientific functions of EURAB/ERAB has now increased to more than 40%.[56] In 2008 the number of advisory groups managed by DG RTD was reduced, and the membership renewed, with the result that 38.5% of the new members were women.[57]

### 5.2.2 Female participation in research projects

The participation of women researchers in projects is lower and falls well below the 40% target. The data from FP6 showed that 16-17% of the scientific coordinators and scientists in charge were women, and although the corresponding figure so far in FP7 is 25.5%, with a slightly higher figure for coordinators than for participants (29% versus 24%), it represents less progress than might have been hoped for given the prominence of the target. However, there is a considerable variation of female participation across programmes and thematic areas, as seen in the figure below: female researchers make up more than a third in areas such as Science in Society, Support for coherent development of research policies and Socio-

[53] European Commission (1999): Women and Science: Mobilising women to enrich European research. COM (1999) 76. Brussels, 17.02.1999.

[54] European Commission (2009): She Figures 2009. Statistics and Indicators on Gender Equality in Science. Luxembourg: Publications Office of the European Union, 2009.

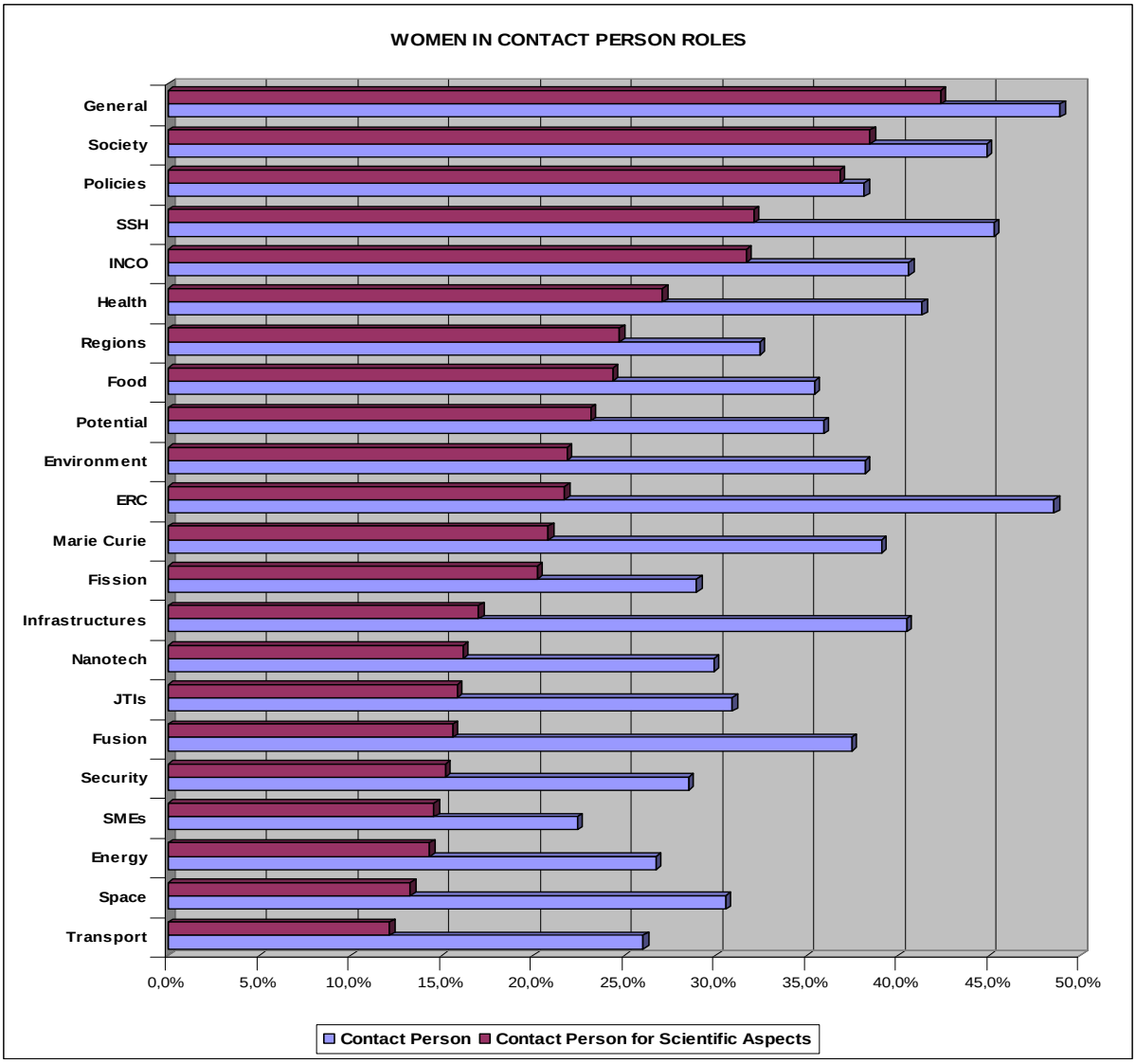
[55] European Commission (2008): Gender Equality Report: Sixth Framework Programme. Brussels.

[56] Third FP7 Monitoring Report, op. cit.

[57] One notable exception (albeit outside FP7) is the recently appointed High Level Panel on the Measurement of Innovation. This panel, supposed to advise the Commissioner and the European Commission on an indicator measuring Europe's progress towards a more innovative economy, consists of twelve men and only a single woman (and hence 7.7% female participation).

economic sciences, but less than 20% in areas such as Nanotech, Security, Euratom, NMP Energy and Space. There is some evidence that younger women are more likely to participate, albeit at a much lower rate than men. For example, 19.4% of ERC principal investigators are women, with a higher number of women selected in the starting grant category (24%), compared to advanced grants (15%). In addition, the data show that women researchers are more present in smaller projects than in larger ones. Women are more likely to take on the role of general contact person, although this is a role more concerned with administrative rather than research tasks.

**Figure 5 Women in contact person roles**




Source: European Commission, Third FP7 Monitoring Report (Monitoring Report 2009)

### 5.2.3 FP6 outcomes and recommendations

The FP6 Ex post Evaluation recommended the continuation of Gender Action Plans (GAPs) in FP7, but this advice was not followed. The FP6 Ex post Evaluation concluded that there is a need to 'substantially increase the participation of female researchers in FP projects', and further suggested that data should be more rigorously collected to provide a best possible basis for policy. This has been followed up, with collection and monitoring of sex disaggregated data.

An important lesson from the FP6 is the indication of a 'glass ceiling' for female researchers, meaning that with increasing seniority, the share of female researchers decreases. The low number of female grantees selected for the ERC advanced investigator grant is an indication that this inherent selective characteristic is persisting, and the Expert Group sees this as a systematic weakness in the European research system at large.

### 5.2.4 Conclusions on female participation

There has been a steady progress towards a more balanced participation of men and women in FP. Given the fact that women account for 30% of the total population of researchers, the 40% target in the 1999 Communication may be seen as ambitious as an immediate goal. A continuous progress beyond the 30% benchmark will have a positive impact on women's participation in the research community in the wider ERA, which the Expert Group sees as positive. But as the current situation is not satisfactory, the Expert Group nevertheless calls for further efforts by the Commission along the present path, both in project participation and participation in various expert and governance entities. However, renewed efforts should be made to reduce contractual obstacles to female participation throughout the project life cycle, from issuing Work Programmes and calls to finalising projects.

In the context of ERA, the situation described in this report reflects the situation in the Member States, where in many cases the share of female researchers (in particular in leading positions) is very low. The Expert Group urges the Member States to make sure that female researchers have better career prospects in national research systems, and that the ERA initiative on research careers addresses this issue. Improvements in the national systems can be expected to have direct impact on female participation in the FP.

## 5.3 New Member States

The statistics on FP7 suggest that the 'performance' of most of the new Member States (EU12) falls short of that of the old Member States (EU15). There are manifestly many possible explanations and it is important to analyse why the shortfall has occurred. The Commission monitoring report refers, for example, to national research landscapes with specific problems, to the lack of a competitive research environment at national level and to problems encountered by smaller countries that cannot be expected to be competitive in all thematic fields of the FP.

Two types of problems can be identified with the EU12 participation in FP7 so far. First, the overall share of EU12 participants in all projects is low. This probably stems from the smaller number of world-class research institutions in these countries than in the EU15, but can be seen as a 'chicken and egg' problem. Second, the funding of successful projects per participant to EU12 countries is lower than for EU15 countries.[58] For example, in Food, Agriculture and Fisheries, and Biotechnology, 8% of partners are from EU12, but they receive only 5% of the budget. Lower cost levels can account for some of the difference, but not all of it.

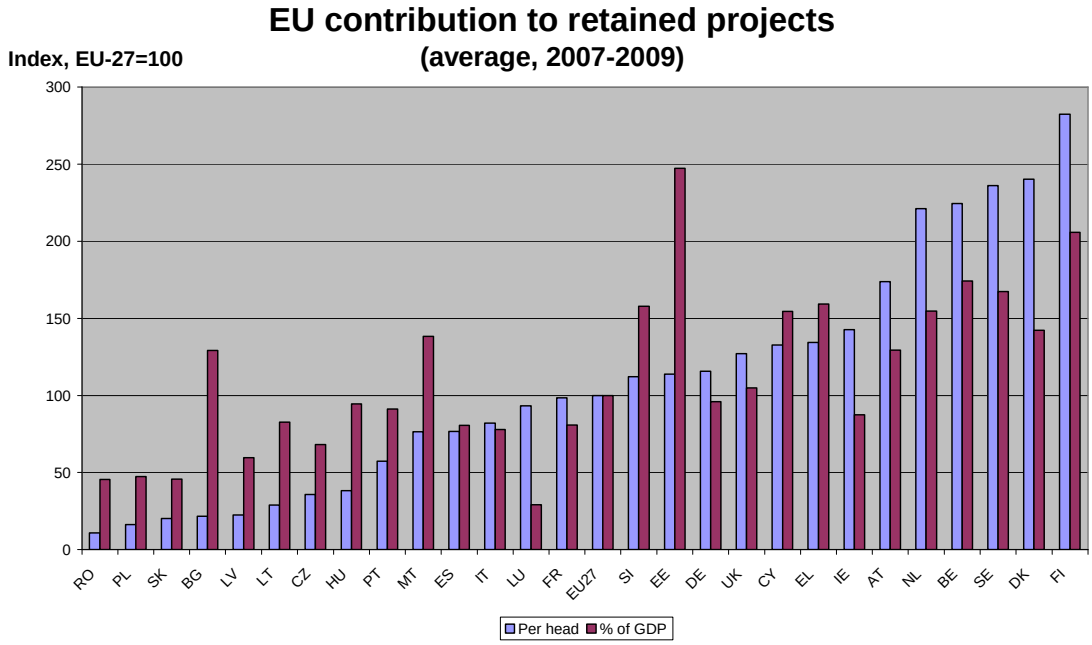
However, different statistics can tell different stories. The overall success rates of EU12 per participant are not very different from those of EU15 countries, but projects with a coordinator from EU12 countries are very rare. Nor is the pattern uniform: the success rates for applicants from EE, LV and CZ are comparatively high (and better than for PT, LU or IT among the EU15), but those for several of the other EU12 Member States are disappointingly low. To try to put the information in perspective, Figure 6 shows the EU contributions obtained by each Member State in 'retained' projects, normalised in two ways: relative to

[58] Third FP7 Monitoring Report, op. cit.

population and relative to the GDP of the respective countries. Because nominal GDP per capita of the EU12 is markedly lower in most of EU12, the GDP statistic systematically gives a more favourable ratio than the population ratio for low income countries. The chart shows:

- That Finland and Estonia are the Member States that, respectively, score highest on the per head of population and per unit of GDP ratios;
- The striking preponderance of central and eastern European Member States at the lower end of the scale.

**Figure 6 EU contribution to retained projects**




Source: Calculations by the Expert Group

The Expert Group is of the opinion that the reasons for low participation rate and, even more specifically, lower financing for EU12 participants should be the topic of further thorough analysis. It is important to stress that there is no automatic presumption – especially in a programme shaped by excellence criteria - that there should be an even geographical distribution of success in FP applications and, indeed, the principles of FP funding would be compromised if a *juste retour* approach were followed. In order to use the full potential of new Member States in increasing EU competitiveness over other regions of the world it is important to design additional tools to improve participation of EU12 in FP projects, at the same time avoiding quotas or other direct forms of positive discrimination. Since spreading excellence is an objective, the low success rates of Romania, Poland and Slovakia, especially, invite considered policy responses.

Nevertheless, a sensitive policy question is brain drain from the EU12. Evidence shows that researchers initially trained in many of these countries tend to gravitate to the favoured Member States in north-west Europe.[59] On the one hand, this could be interpreted as what the ERA is supposed to promote, with the best researchers coming together in the strongest research institutions. On the other, it could be seen as aggravating an imbalance which will inhibit future knowledge creation. The Expert Group argues that during the remaining years

[59] Inzelt, Annamária (2010): Analysis of researchers' mobility in the context of the European Research Area (Expert analysis in support of the Interim Evaluation of FP7).

of FP7 and certainly in FP8, enough attention needs to be paid to creating research capacity – in terms of both human and physical capital – outside favoured regions.

Opportunities for mobilising research potential (and therefore their participation success) could be boosted by using other EU support schemes, like the Structural Funds which could offset the lower financing through FP7. However, although this funding helps considerably to improve research infrastructures, the use of these resources to develop human capital in the EU12 is very limited and hence the Structural Funds cannot substitute fully resources available in FP7. Moreover, the use of Structural Funds is usually decided by the Member States themselves and, in some of them, research and innovation are not at the top of their priority lists.

More generally it is important to recall that the 'European added value' of financing research and innovation through FP7 includes long-run enhancement of research capacity. Too narrow a focus on 'research excellence' can overshadow the benefits of full-scale involvement of EU12 in the FP and this should not be neglected.

## 5.4 Industry

FP7 aims to bundle together all research-related EU initiatives to boost growth, competitiveness, and employment. Innovations are the key elements to achieve these ambitious goals. As a consequence the Framework Programme has to cover the whole innovation process from basic research to demonstrators. Companies are the major drivers in bridging the gap between research results and innovation. Yet, despite the acknowledged importance of both large companies and SMEs in this role, industry participation, whether as a share of funding or number of participants, has been declining continuously for fifteen years. As figure 7 shows, it fell from 39% in FP4 to 31% in FP6 and currently accounts for only 25% in FP7. The decline may be somewhat overstated, because some of the industry participation is expected to come through JTIs which have been slow to develop and for which there are, as yet, insufficient statistics about industry participation, so that an exact comparison with previous FPs cannot be provided.

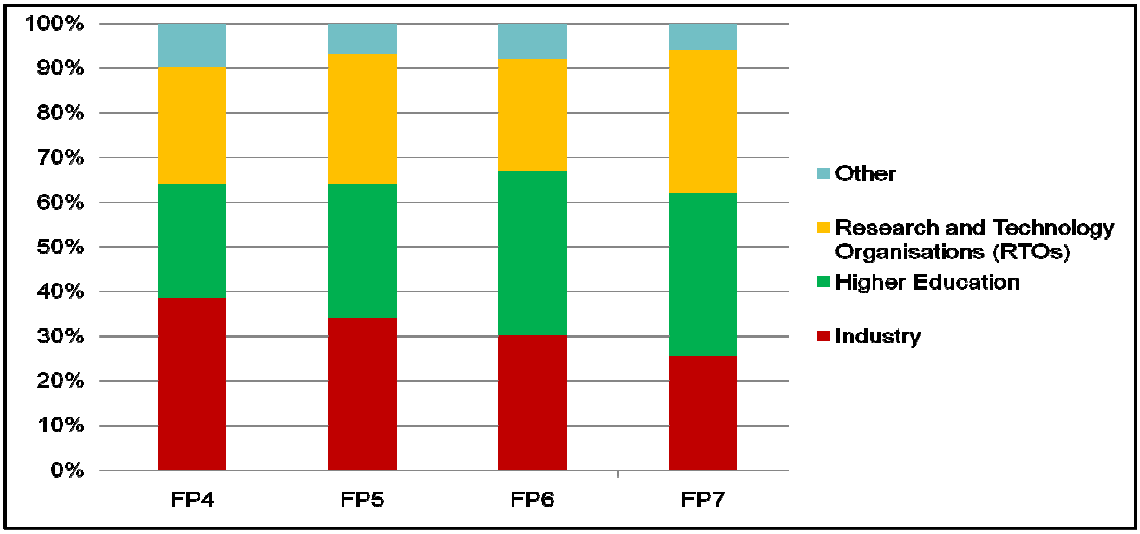
Companies are faced with burdensome and expensive processes for participation, with complex instruments, post-project auditing practices which result in unexpected financial penalties, and financial rules that are too often hard to understand.[60] These reasons, among others, deter companies from participation and may mean that Europe's capabilities for innovation are not fully exploited. As a result, the goals of FP7 will be very difficult to achieve.

Despite these barriers, many significant research leaders among European companies are engaged in FP7. A table of the companies receiving the largest grants (Appendix 1) shows the top 50 industrial recipients of FP7 funding. Between them, the top 50 were allocated some €530 million from 2007-09, representing just over 3% of the total investment by the EU over the period. The top 50 is dominated by companies based in Germany (14), Italy (9) and France (8) and is notable for the absence of companies from any of the EU12 Member States. However, the table also suggests that 'big industry' is not receiving particularly large amounts from the Framework Programme (as is sometimes claimed). Of the top ten recipients, only one consortium – DANTE, the industrial grouping that manages the GÉANT infrastructure project - receives more than €25 million. In any case, the amounts obtained by some of Europe's largest and most research intensive companies are a drop in the ocean of research budgets that are measured in billions of euro. In essence, the cash is not the main reason for

[60] Interim Evaluation of the ICT Research in the Seventh Framework Programme, op. cit.

large enterprises to participate in FP projects. Rather their motivations are primarily to gain access to trans-national R&D-networks, knowledge creation, idea generation, and strategic partnering for long term cooperation and pre–standardisation. The engagement of large companies in research provides a valuable bridge from pre-competitive research to innovation.

**Figure 7 Participation by stakeholders**




Source: European Commission, Second FP7 Monitoring Report, October 2009.

### 5.4.1 Involvement of SMEs

SMEs comprise 99% of all companies in Europe and a high share of total employment, estimated at around 65 million, and are generally the primary source of net job creation. They are both performers of research, especially in some of the leading-edge 'new' economy sectors, and consumers of it. These two aspects are mainly provided for in, respectively, the engagement of SMEs in *Cooperation* where there is a target that at least 15% of the total funding should be devoted to SMEs; and in the specific programme *Capacities* in which there is a sub-programme of research for the benefit of SMEs. The latter comprises out-sourcing to researchers in universities and RTOs and, in the 2011 Call, provision for demonstration activities, as well as some support for international collaboration and dissemination.

The Expert Group notes (and is somewhat uneasy about it) that the officially recognised EU definition of an SME, stemming from a Council Decision (2003), is one which embraces 'more' than the conventional notion of a small business driven by an entrepreneur with a bright idea.[61] It includes certain not-for-profit organisations which appear to have the character of non-governmental organisations, rather than businesses. The latest internal monitoring information from the Commission suggests that the participation of SMEs in *Cooperation* has been edging upwards in successive years of FP7, such that the 15% target is close to being met and may well attain the desired level over the lifetime of FP7.[62] SMEs are most prominent in the nanotechnologies and new materials, and the security sub-themes of *Cooperation*, and provisional data suggest that SMEs will exceed the 15% target for participation in JTIs. The average success rate of SME applicants is 17%, compared to 20%

[61] A test of whether an entity is an SME, available of the Commission web-site asks, as its first question, whether the entity is a company, a non-profit organization or someone self-employed, and all three are deemed to be variants on SMEs.

[62] Mid Term Report on SMEs' Participation in the 7th R&D Framework Programme, op. cit.

for all applicants, pointing to a higher rate of wasted effort by SMEs which could be a deterrent to their engagement.[63]

In other areas of FP7, SMEs unsurprisingly, do well in *Capacities* through the funding targeted explicitly at them, but have a relatively low share of *People* (9.5%) and are virtually absent from *Ideas*. There are, however, very different rates of SME participation in different segments of specific programmes. For example, among the Marie Curie actions in *People*, while individual fellowships rarely involve SMEs, SMEs participate actively in the Initial Training Networks (9% of all participants, and more than 50% of businesses participating in this action). Moreover, SMEs make up 25% of all participants in Industry-Academia Partnerships and Pathways and their budget share is 33.4% of the total for this Action. That said, it is important to note that the participation rate does not reflect the exploitation of results nor the global competitiveness of SMEs. Unfortunately, there are no data available about the innovation power of SMEs that have taken part in FP7, nor the extent to which projects in FP7 have resulted in the creation of new high-tech firms.

### 5.4.2 Conclusions on industry in FP7

Despite the above shortcomings, FP7 plays (and its predecessor programmes played) an important role in creating knowledge, stimulating innovation and, to some extent, in aligning national R&D programmes. It is clear, however, that industry is deterred to a greater degree than other research performers by the weight of bureaucratic burdens and, on occasion, by a perception of insufficient flexibility in Work Programmes. More effort should be devoted to achieving greater impact regarding innovation, in stimulating the participation of industry and SMEs, and in focusing on the whole innovation process. Without addressing these challenges rapidly, future Framework Programmes are unlikely to fulfil expectations of their contribution to innovation in Europe.

*Competitiveness and impact*

To strengthen the competitiveness of European Industry, the Commission should gear research and innovation policy towards underpinning sustainable economic growth, as is presaged in the Innovation Union flagship initiative. In particular, emphasis should be given to ‘Grand Challenges’ which promise sustainable growth. A transparent process for priority setting which is in line with future market demands has to be implemented. Industry and Research bodies should be deeply involved in this process. Concentration of resources around fewer topics with critical mass is necessary to establish world-class research excellence in areas of importance for the European economy. In addition, all stages of the innovation process from basic research, applied research to market relevant demonstrators have to be considered. Multi-disciplinarity in the innovation and development process has to be increased to meet market requirements.

To ensure the balance of FP7 between consensus-based R&D and more disruptive R&D, resources have to be allocated to a judicious combination of R&D topics which promise radical innovations, and should embrace both a bottom-up and a top-down approach. To respond to the challenges of a global market the Commission should make the best use of global partnerships and should continue to extend the global reach of the Framework Programmes without neglecting the participation in non-EU national R&D programmes.

[63] Third FP7 Monitoring report, op. cit.

*Participation of industry and SMEs*

Industrial participation in FP7 is clearly much more intensive in some thematic areas than others, but the overall downward trend is a concern.[64] It is important to underline successes such as in NMP, Transport, Security and Energy themes under *Cooperation* which are achieving success in bringing-in SMEs. But it also has to be pointed out that industry participation in other themes, notably Health, and Food and Biotech (which might have been expected to see substantial industry interest), is surprisingly low. The Expert Group therefore calls on the Commission to investigate these discrepancies and to explore how what works in one theme could be transferred to others.

It may be that the 15% target for SMEs (as already indicated in the FP6 evaluation) is unhelpful, although an alternative perspective is that even though the target is arbitrary,[65] it may push the Commission services to be far more receptive to SMEs becoming engaged in projects and thus proactive in encouraging them. Given that a key motivation for involving SMEs is to provide means of translating research into innovation, some of the resources targeted at non-RTD performing SMEs should be re-thought. More attention should be paid to the *quality* and constructive engagement of SME participation rather than just widening it. In this way, the key role of SMEs as the bridge from pre-competitive research to innovation could be enhanced.

To increase the participation of industry and SMEs the Commission must reduce the administrative burden significantly and the arbitrariness of auditing practices. The Commission should create a flexible, lightweight and well-defined form of sub-contracting or associate partnership for SMEs. Moreover, the Commission has to switch from a low-risk, low-trust attitude to a more trust-based and risk-tolerant approach.

To reduce the current massive waste of effort in writing good-quality but nevertheless fruitless proposals, the Commission should test a more sophisticated two-stage application process (like in ERA-NET), especially for calls with a broader thematic approach. Proposals proceeding into the second stage ought to have a 30-50% chance of acceptance.

There is no doubt about the strategic importance for Europe of the establishment, growth and development of research-based firms. It is advisable that the European Commission collects accurate statistical and survey-based data regarding the impact of FP7 in this particular dimension.

*Instruments*

Although industry shares many of the concerns of other FP participants about how several of the instruments function in FP7, its reservations about those in which it is expected to participate most extensively are especially relevant. For example, given the criticism of the administrative structures of JTIs, with each of the new initiatives creating its own legal and administrative framework, a view from industry is that radical steps should be taken to streamline procedures.

Industry also has a distinctive perspective on how to build a European Research Area that combines the needs and assets of national and European programmes, and would like the Commission to clarify how the portfolio of instruments at its disposal is intended to support

[64] A point stressed by the ERT FP 8 Reflection Group and brought out in interviews with stakeholder. It is also congruent with the findings of the Interim Evaluation of the ICT Research in the Seventh Framework Programme, op. cit..

[65] AVEDAS AG., et al. (2010): Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programme for RTD. Final Report, March 2010.

both FP7 Programme and ERA goals. Specifically, industry representatives call on the Commission, with the Member States, address issues of dual management, separate reporting, barriers to the mobility of researchers and lack of coordination.

## 5.5 Promotion of cross-disciplinary research

There are no particular references to the promotion of cross-disciplinary research in the overall objectives of FP7, but such an objective is clearly stated in the annex of the decision for the *Cooperation* programme:[66]

> 'Special attention will be paid to ensuring there is effective coordination between the thematic areas and to priority scientific areas which cut across themes, such as forestry research, cultural heritage, marine sciences and technologies.
>
> Multi-disciplinarity will be encouraged by joint cross-thematic approaches to research and technology subjects relevant to more than one theme, with joint calls being an important inter-thematic form of cooperation'.

### 5.5.1 Achievements

The overall policy-driven nature of FP7 seems to provide a general support for cross-disciplinary research. It does not call for projects based on single disciplines and even the *Ideas* programme, which aims at funding 'frontier research' solely based on scientific excellence can sustain inter-disciplinary work. The general problem orientation of FP7 comes through in the way the different specific programmes and thematic areas of the *Cooperation* programme develop Work Programmes and calls for proposals that are targeted at certain challenges or application areas for research. It can thus be stated that the FP7 in an implicit and generic way promotes cross-disciplinary research. This is supported by the self-assessments provided by Commission representatives of whether the various programmes and thematic areas are achieving expectations of cross-disciplinarity. On a scale from 1 to 6 (6 being 'fully achieving expectations'), virtually all give scores of 5 or 6.

However, there are several points to note. First, cross-disciplinarity has different meanings in different parts of the FP7. In some thematic areas it is defined narrowly, mostly through specialised sub-fields of a given technological area; in others it includes scientific disciplines spanning natural sciences and social sciences and humanities. Hence Commission representatives also attach different meanings when responding on the issue. This great variation in the understanding of cross-disciplinarity makes it correspondingly difficult to assess the real achievements.

Second, the concept of cross-disciplinarity seems to be a rather loose expression of a variety of ways in which different forms of knowledge and expertise are combined in projects. There is a great difference between interactions of scientific disciplines in frontier research funded through the specific programme *Ideas* and the combination of expertise in applied industrially related projects. In the latter case, industrial firms, research institutes and/or universities take part in the projects not necessarily with different scientific disciplines, but with expertise linked to research versus practical application, or as user-producer relations in industrial value chains. It seems, for example, evident that SMEs, greatly promoted as a horizontal issue in the FP7, take part in projects with very different roles. The recent impact assessment of SMEs from FP5 and FP6 as well as earlier studies of socio-economic research confirms this. The project consortium, being groups of at least three participants, is the key vehicle to ensure a combination of scientific knowledge and expertise. Again this is different across the specific programmes, *Cooperation* being the main promoter while *Capacities* mostly does so more

[66] OJ L 412, 30.12.2006, P. 007.

indirectly. In *People*, more than 60% of the budget goes to collaborative, consortium-based projects. As the FP6 Marie Curie Impact Assessment shows, Marie Curie Actions are about exchanging knowledge and gaining new experiences from network cooperation, as well as mobility.

Third, cross-disciplinarity is inherently promoted through the Work Programmes and the calls for proposals. For example, the 'Oceans of Tomorrow' calls in 2009 and 2010 (for work programs 2010 and 2011) were launched with contributions from the thematic areas Food, Agriculture and Fisheries, and Biotechnology, Energy, Environment, and Transport. In the recovery package launched to counter the recent economic crisis, three public-private partnerships were initiated: *Factories of the Future*, *Energy-efficient Buildings*, and *Green Cars*. These initiatives were based on participation from the thematic areas of NMP, ICT, Transport, Environment and Energy. Thus, when calls are directed at explicit challenges that are broadly defined, the cross-disciplinarity seems to be effectively promoted. This is also reflected in the high scores given by Commission officials. It should also be noted that the Commission has recently launched a dedicated system for 'Monitoring the FP7 Contribution to the renewed EU Sustainable Development Strategy'. The Expert Group commends this development, as it creates a highly useful basis for assessing how the FP7 contributes to a key global challenge.

### 5.5.2 Conclusions on cross-disciplinarity

Overall, the FP7 seems to contain appropriate mechanisms to ensure adaptability vis-à-vis changing needs and emerging policy concerns. This is clearly the case with the cross-thematic calls. With the increasing focus on grand or societal challenges driving research priorities in the FP7, such cross-disciplinarity could be even further promoted and enhanced. There could also be a better common understanding of this issue in the Commission itself, including the scientific officers conducting negotiations and project monitoring. This could contribute to a better balance of scientific and expert knowledge in the design of consortia.

There should be a greater appreciation of the importance of the more generic combination of knowledge, expertise and project roles in consortia as this is the 'every-day' cross-disciplinarity of many projects developed for policy or application purposes. With the increasing attention to the importance of innovation, this will be all the more important. Lastly, the panel notes that both the *People* and *Capacities* specific programmes could develop ways to enhance the capabilities for management of inter-disciplinary projects and complex projects more generally. This is of particular importance in less developed regions and Member States which will need to develop their human capital in this particular area to meet demands for innovation and cooperation.

## 5.6 International cooperation

With the launch of FP7, a partly new approach to international cooperation was introduced. Dedicated budgets have largely been abandoned and there has been an ambition to integrate the international dimension in each of the thematic areas of the specific programme *Cooperation*. To this end, an instrument called Specific International Coordination Actions (SICA) was launched in FP7. SICAs are aimed at promoting the participation of non-EU Member States or Associated Countries in FP7, through collaborative projects within particular thematic areas, as part of the specific programme *Cooperation*. The INCO part of the specific programme *Capacities* has been developed and expanded, introducing several new instruments (such as INCO-NETs). In parallel, one of the key objectives of the ERC was to attract world-class excellence to Europe, and to repatriate European researchers.

As in FP6, low- and middle-income states, so-called ICPC (International Cooperation Countries) can participate and receive funding in FP7 on the same terms as Member States and associated countries. Certain thematic themes have also allowed industrialised countries to be funded through the FP. More significantly, for the first time in FP7 a whole thematic area has been reciprocally opened between the US and EU (NIH /Health in FP7). For FP7, the scope of the associated countries is wider than ever before, now encompassing all of the Western Balkan States. In addition to the 13 countries currently on the list,[67] Russia, Ukraine and Moldova have formally requested to be associated. So far in FP7, the 13 associated countries have received 8.8% of the EC contribution.

Up to March 2010, countries outside the Member States and associated states provided 5.18% of all participations. In budgetary terms, these countries have received in total €214m (1.68%) of the EC contribution to FP7, out of which €178m (83%) comes from their participation in the thematic priorities in *Cooperation*. About €31m comes from the INCO budget. Participants outside Member States and associated countries still coordinate very few projects (0.86% of all FP7 projects).

**Table 4 European Union contributions to top 16 FP7 participants outside the EU/associated countries[68]**

| Country | Nb of coordinators | Nb of participations | EC contribution (million €) | Country | Nb of coordinators | Nb of participations | EC contribution (million €) |
|---|---|---|---|---|---|---|---|
| Russia | 7 | 237 | 28,69 | Kenya | 1 | 25 | 4,63 |
| India | 10 | 145 | 17,37 | Tunisia | 2 | 27 | 4,11 |
| China | 4 | 144 | 16,01 | Mexico | 2 | 37 | 4,03 |
| United States | 1 | 289 | 14,73 | Tanzania (United Republic of) | | 22 | 3,54 |
| South Africa | 2 | 91 | 12,44 | Viet Nam | | 25 | 3,35 |
| Brazil | 2 | 78 | 11,40 | Australia | 1 | 84 | 3,29 |
| Ukraine | 5 | 85 | 7,53 | Uganda | | 20 | 3,18 |
| Argentina | 4 | 58 | 7,03 | Other third countries | 17 | 703 | 67,49 |
| Morocco | 1 | 41 | 4,63 | **Total** | **59** | **2 111** | **213,45** |

As for the ERC, preliminary statistics indicate that only a small proportion of grant-holders were 'third country' nationals and half of them originated from the US. In the first four ERC calls, 33 investigators resident abroad were funded, as were 46 non-EU citizens already resident – together just under 8% of awardees (ERC paper on 'Early signs of wide-ranging impacts').

The specific programme *People* contains some of the most international instruments in FP7, with 25% of funds dedicated annually to International Cooperation projects. Introduced in FP7, the International Research Staff Exchange Scheme (IRSES) fosters international cooperation with key partnership countries. According to the recently published Monitoring Report, some 179 institutions from 75% of all eligible Third Countries applied.[69] In addition, countries other than Member States and associated countries were among the signatory

[67] Switzerland, Israel, Norway, Turkey, Croatia, Serbia, Iceland, Former Yugoslav Republic of Macedonia (FYROM), Montenegro, Bosnia – Herzegovina, Liechtenstein, Albania, Faroe Islands.

[68] Figure by Expert Group based on data from entire FP7 until March 2010.

[69] Third FP7 Monitoring Report, op. cit.

partners in the 2008 ITN (Marie Curie Initial Training Networks) and IAPP (Marie Curie Industry-Academia Partnerships and Pathways) funded projects.

With the introduction of SICAs, it appears that some researchers from 'Third Countries' have steered their participation away from general *Cooperation* calls towards targeted openings. Although it is too early to assess the consequences of this development, it should be monitored closely. The Expert Group also questions whether enough attention is paid to the strongest research countries, notably the US.

### 5.6.1 Conclusions on international cooperation

The Expert Group concludes that during its first three years of implementation, several instruments of FP7 have actively promoted international collaboration. The general opening of the FP7 to international cooperation is of great value. However, evidence indicates that not much progress has been made compared to FP6 and the available statistics do not indicate any major change in 'Third Country' participation. The participation in FP7 of the strategically important BRIC countries is still weak, despite efforts to increase collaboration and raise awareness about FP7 in these countries.[70] This development gives cause for concern, since it is important that collaborative projects are connected to the emerging economies and their global knowledge and innovation networks. There is a need for a wide-ranging review of the international dimension of the FP, with the aim of ensuring that international participation is integrated in all sub-programmes rather than being seen as a separate activity.

The Expert Group notes that Marie Curie is succeeding in engaging internationally and initial indications are that the ERC is helping to attract world-class researchers from outside the EU, even though they are still a relatively small proportion of investigators. The Expert Group welcomes the setting-up by the ERC Scientific Council of a working group to recruit more researchers from third countries. The recent reciprocal opening of NIH and FP7 Health is an interesting development, but it is too early to assess what this will imply for EU-US collaboration within life science research. Hence, the Expert Group concludes that the Commission and Member States should follow and monitor this pilot closely, so that it may be reproduced and expanded to other areas.

Despite these piecemeal successes, the Expert Group concludes that the 'mainstreaming' of international cooperation is not living sufficiently up to expectations and is an aspect that needs attention. In general, the focus of the international dimension of the FP7 should increasingly be on engaging with partners from countries outside Europe on equal terms and in programmes and activities of high mutual interest, and for FP8 there should be an intensification of international cooperation.

Established in 2009 as a partnership initiative between Member States and the Commission, the Strategic Forum for International S&T Co-operation (SFIC) was given the task to identify common priorities which could lead to coordinated or joint activities, and to further develop international dimension of the ERA. The Expert Group supports a coherent strategic development for international cooperation.

[70] The total budgetary contribution to all participants in the BRICs countries in FP7 so far is around €85 million, which can be compared to the universities of Oxford (€97 million) and Cambridge (€98 million).

# 6 Simplification

One of the most frequently heard complaints about FP7 is that it is overly and needlessly bureaucratic, and it became increasingly clear to the Expert Group as its work progressed that this is the issue that warrants most attention. Moreover, the final evaluation of FP6 set out a range of proposals for improvements on which the present Expert Group was explicitly invited to report. This chapter therefore brings together various dimensions of simplification.

## 6.1 Taking-stock of simplification

At an operational level, FP7 has done the great bulk of what was expected of it. Themes have been developed, calls have been issued, proposals have been peer reviewed and evaluated without obvious difficulties, and decisions on project funding made, all more or less on schedule and with few apparent objections from the research community. Although redress procedures have been called upon, the outcomes suggest that the whole process has been efficient and fair. Problems arise, nevertheless, in the subsequent stages of project negotiation and management.

There are many explanations for the complexity of the administration of FP programmes, and FP7 in particular. Clearly, the *Financial Regulation* imposes constraints and has led to rules that have to be enforced, however vexatious they might appear to those who have to abide by them. Yet there can often be an impression that complication is introduced without good cause and that the 'machine' is better at generating it than simplifying it. According to a submission to the Interim Evaluation Expert Group,[71] there are 700 new rules in FP7, and even if there is some exaggeration in this figure, it is hard to square with a simplification agenda.

### 6.1.1 What has been done…

Several of the changes that were implemented for FP7 have been welcomed by the research community and have undoubtedly been successes, notably the unique registration facility (URF), the EPSS submission tool and less demanding audit requirements. The self-assessments by officials responsible for different areas of FP7 are reasonably positive about the efficiency of the programme, scoring the FP at three out of four for the systems and procedures and giving it top marks for clarity and transparency. Most claim that the programme has been able to adapt to changing needs and none ticked the box for 'change is too difficult'. A survey conducted in the spring of 2010 of NCPs suggests that there have been improvements relative to FP6, especially in finding information, in application procedures and IT tools. Analysis of the stakeholder consultation carried out for the Interim Evaluation reveal that 55.7% of the 537 respondents consider that the simplification measures have been partially successful and a further 11.7% say 'mostly successful', while 15.1% think they have been unsuccessful.

It is important not to lose sight of these advances, and to recognise that transitional problems associated with the creation of new executive agencies to administer specific programmes were to be expected, while the roll-out of new IT tools would inevitably require some familiarisation on all sides. It should also be reiterated that the Research Executive Agency responsible for the *People* and parts of the *Capacities* programme only became fully autonomous in 2009.

[71] State Secretariat for Education and Research, FDHA, Swiss Confederation. Bern, 25.06.2010.

### 6.1.2 …and what has not

However, the lack of progress on many known problems is disappointing and the Expert Group notes that what seems to be tolerated by the Commission is seen by other stakeholders as increasingly puzzling and unsatisfactory. The opinions elicited from the survey of NCPs are least positive about grant negotiations, the various facets of project management and communication with the Commission. The evidence the Expert Group has heard and recent contributions[72] draw attention to, *inter alia*, the following:

- Excessive time to contract and unexplained variations between different themes
- Still overly demanding reporting obligations, including what appears to be needless duplication of reporting where there is co-funding
- Inconsistency in the application of rules or implementation of procedures. This can arise not only between instruments or themes, but in some cases as a result of differing interpretations being offered by the scientific and financial officers responsible for a single project.

A recently completed study for the European Parliament by Deloitte Consulting,[73] similarly, identifies the culprits and possible ways forward. It highlights as its main conclusion that 'only a small number of rules are criticised as such by beneficiaries, and that *the manner in which the rules are implemented is more problematic* than the rules themselves' [emphasis added]. The study nevertheless cites as requiring attention the poor alignment of various issues with the realities research organisations have to face, notably in relation to pre-financing, calculation of eligible costs and certification procedures.[74] Problems are also identified in the timely communication of rules and in the approach to auditing.

## 6.2 Time to grant

The disparities in time to grant (TTG) are especially alarming and constitute a considerable barrier to the engagement of SMEs, and there is evidence that even within DG RTD of the Commission, there is not a common approach to targets.[75] However, better software and experience are helping, and several of the self-assessments indicate that TTG has fallen since the first calls.

The Expert Group finds it hard to explain why so many projects take so long to start, and is concerned that this reveals a lack of urgency or commitment to find solutions. Delays can even undermine the case for support: for example, research for the benefit of SMEs under the *Capacities* specific programme has a mean TTG of 456 days. Given that the nature of small business is inherently fast-moving, this is a disturbing statistic and also one which reinforces the complaints of small business about delays. Within *Cooperation*, the TTG in the

---

[72] For example: Deloitte Consulting (2010): Financial rules in the research framework programmes – streamlining rules for participation in EU research programmes (Study for the DG for Internal Policies of the European Parliament, Policy Department D - Budgetary Affairs), Diegem, May 2010; European Commission (2010): Simplifying the implementation of the Research Framework Programmes, COM (2010) 187, Brussels, 29.04.2010.

[73] Financial rules in the research framework programmes – streamlining rules for participation in EU research programmes, op. cit.

[74] Also sharply criticised in the 2010 NCP survey in which only a quarter of the respondents rated the effectiveness of certification of methodology high or very high, whereas 32% considered it as low or very low and 19% had no opinion.

[75] Time to grant (TTG) indicators are also measured in different ways by different services, judging by the self assessments, with some referring to 75% achieved, and others to 50% .

(substantial) sub-themes of environment, transport and security (in order of time taken) is around double those of the sub-theme of ICT. The Expert Group has been unable to obtain convincing explanations for these disparities. Some difficult cases are inevitable, but not to this extent.

## 6.3 Scope for further improvements

Further changes are on the table following the recent Commission Communication[76] and there is already a move to stress the imperative of further simplification following a meeting of Research Ministers held on 16th July 2010. As a result, the Council agreed a series of initiatives at the end of August 2010. The Belgian Presidency announced that simplification is one of its priorities for the current semester, while also seeking to rebalance procedures to facilitate greater risk-taking and a focus on results rather than costs. However, it is important to recognise that a possible danger in a 'results' focus is that it would favour safe projects.

The NCP survey carried out in spring 2010 revealed polarised opinions on simplification. 24.6% of the respondents (most of whom might be expected to have a broad experience of FP7) disagreed or strongly disagreed that FP7 is getting simpler to use in terms of administrative and financial procedures, compared to previous FPs, whereas 28.9% agree or strongly agree, although it is noteworthy that the question elicited non-responses from half those completing the survey. The survey and other analyses of 'complexity' bring out the following aspects of FP7 procedures that are having adverse effects on the quality of research and inhibiting the implementation of FP7:

- Confusion due to differences in rules (depending on programmes/schemes) and also in 'interpretation of rules' (by auditors, by project officers)
- Late publication of Work Programmes, lack of information prior to publication of calls
- Long time to contract/ grant, uncertainty about the starting date of the project
- The focus is stronger on financial issues than on exploitation of research results; 'too much management and not enough research'
- Too high level of detail is required for audit certificates and the upshot is a 'zero-trust' policy
- There is uncoordinated audit management
- Difficulties still arise in project management due to heavy reporting procedures and big size of consortia
- There are still too many problems with IT tools, and poorly harmonised application, negotiation and reporting tools among the DGs and Executive Agencies involved in the Framework Programme. The current use of different systems is confusing and complex.

The self-assessments by Commission services make a number of relevant points about TTG. For example, one observes that the procedures from negotiation to contract signature are at present very linear and sequential. The scope for having parallel procedures to quicken time to contract would be worth investigating. Evidently lessons can be learned from the huge disparities between TTGs in different areas of the FP. It is hard to escape the conclusion that decisive management would sort out many of the inconsistencies. The Expert Group

[76] European Commission Communication 'Simplifying the implementation of the Research Framework Programmes', op. cit.

recognises that the establishment of new executive agencies may have been a factor, but it is not an excuse.

## 6.4 Conclusions on simplification

The Expert Group is conscious of the tensions between adequate financial control and flexibility, but is of the opinion that there is a risk aversion culture in the administration of FP7 which is ultimately against the interests of all stakeholders. Research is an inherently risky business with uncertain outcomes and it would be preferable if risk were managed rather than avoided at all costs. Certainly, there should be no equivocation about punishing fraud, but an appropriate level of unauthorised initiative should be tolerated if it is in the interests of the effective running of projects.

The Group has been made aware of possible solutions to simplification issues which could be envisaged without compromising financial integrity, many of which – as the 'Trust Researchers' campaign stresses – turn on the attitude adopted to risk and trust in researchers. Better risk management would lighten the administrative burden on beneficiaries and the Commission services alike. It would also support a climate of trust and risk-taking which is favourable to innovation and creativity. To give some examples:

- The ESA makes a distinction in risk tolerance between more applied research and basic research. Financing basic research is not current spending, but investment. The higher the risk, the higher the possible return, so that if 2% is the risk threshold, the investment is unlikely to yield very high returns.
- For many purposes lump sum payments would be preferable in the interests of efficiency, even though greater financial risks might ensue.
- It may be that 'one size does not fit all', for example in the context of indirect cost calculations for universities and SMEs, and that more discretion could be vested in scientific and financial officers in finding suitable compromises.

A lesson that can be learned from FP7 with implications for FP8 is that many of the problems that occur in the first two years of a Framework Programme are caused by the procedures not being ready. When extensive changes are envisaged they should be agreed early and incorporated in any administrative arrangements before calls are issued. Examples include Rules of Participation, Model Grant Agreements, reporting/auditing guidelines and the submission system, as well as the associated IT systems. The clear implication is that greater continuity should be encouraged.

The simplification issue has been on the table for so long and has proved so difficult to solve that the Expert Group has struggled to identify what more to propose, other than the obvious advice of taking decisive action to deal with the known shortcomings. Indeed, the Council Conclusions of 31.08.2010 provide a clear overview of what is needed. There is an open question about the role of the Commission and whether more of the administrative burden should be out-sourced to executive agencies. Some of the constraints come from outside the immediate domain of research administration, notably those emanating from the *Financial Regulation*, but the latter should not be used as a pretext for inaction.

# 7 Outcomes and impacts

The outcomes and impact of FP7 cannot credibly be measured after three years, because even where projects have been completed, the inevitable lags between research and publication of results or in the translation of findings into policy or societal impact mean that any tally would be a severe under-estimate. This is even more true concerning economic impact in terms of, for example, business results generated from technical innovation.

## 7.1 Scientific outcomes and impacts

Plainly, FP7 is attaining many of its core aims effectively and successfully. It attracts high quality researchers across the board and, in *Ideas*, has increased the participation of the best European researchers engaged in leading-edge research. Both in *Cooperation* and in *People*, there is evidence of strong competition for funding and robust application of project selection procedures, ensuring that in these specific programmes, as well as *Ideas*, excellence is to the fore.[77] This reaffirms the finding of the FP6 evaluation that EU funding is not just for the B-team, but attracts A-team members. It is also significant that the FP has become a stable feature in the European research landscape, with ever more universities treating it as a vital resource and adapting research strategies and administrative capacities to participate in it.

The goal of excellence has many sides to it and cannot easily be encapsulated in a simple definition. It entails attracting the best researchers and rewarding the best proposals, with peer review by leading scientists as the mechanism to assure that excellence. Relevant watchwords include leading-edge, originality and ground-breaking, possibly leading to a tension about what weight to give to other attributes such as inter-disciplinarity, inclusiveness or even creativity. To ensure that excellence is enduring, researchers need sufficient incentives in the form of acceptable success rates, but the door simultaneously has to be open to new entrants and ideas, thereby ensuring that dominant paradigms and actors are open to challenge. Hence, there is a need to foster future excellence by supporting the development of promising researchers or those outside established networks. These can be difficult aims to reconcile in a single approach.

Excellence is easiest to demonstrate for the ERC which prides itself on the very high status of the members of its evaluation panels. In effect, therefore, it has a clear sense that 'excellence is what is recognised as such by reviewers who have themselves demonstrated their own excellence', and ought to be self-propagating. For collaborative projects, excellence could be tempered by the need for a consortium, but the insistence on a high threshold for scientific excellence is a safeguard and the Expert Group is reassured by the evidence it has seen on the high scientific quality standards of *Cooperation* projects. Nevertheless, the overall weight of just a third given to the scientific criterion in evaluation can mean that proposals that score highly on the other two sets of criteria may trump the scientifically best. The Expert Group recognises that this is a difficult balance to strike.

The key findings from the self-assessments by Commission services clearly show that, regarding scientific quality, '62% of services state that independent review or other similar evidence indicate that a majority or nearly all research is world-leading in terms of its originality, significance and rigor'. Similarly, in the stakeholder consultation, the great

[77] This should not be read as a criticism – by omission – of the specific programme *Capacities* given that its primary mission is to build capacity rather than fund research.

majority of respondents expect FP7 to have enduring impacts, 17% saying that such impacts are 'highly likely,' and 66% saying that they are 'likely'.

This is no real surprise since, on the one hand, the selection criteria for funding are demanding and include a focus on impacts, and that, on the other, FP7 attracts the best and most appropriate researchers and research organisations. It is also instructive to note that the stakeholder consultation highlights the diversity of ways in which impact occurs and should, thus, be appraised. It arises, *inter alia*, from networking and collaboration, through leverage effects and as a result of raising the bar for research generally. Findings from a study done for the UK government[78] show that it is important in assessing scientific outcomes to look beyond the direct scientific outputs of projects. The study finds that 'the FP has had a big impact on the nature and extent of UK researchers' international relationships and networks, as well as on their knowledge base and scientific capabilities', and it is reasonable to infer that similar outcomes will have occurred elsewhere.

It may also have a structuring effect on national innovation and research systems, notably in Member States where they are less developed. But to consolidate these gains and to make impacts enduring, researchers have to be able to obtain repeat funding. This suggests that for excellent scientific outcomes and/or impacts to be capitalised, continuity in FPs must be ensured, while avoiding giving 'insiders' too easy a ride.

The interface between research outputs and innovation is crucial. According to the Technopolis report for the UK government, 'the FP has yielded important commercial benefits. UK business participants had made or gained access to new or significantly improved tools or methodologies and other forms of intellectual property. Participation had contributed to the development of new products and processes and increased income and market share'.

## 7.2 Leverage effects on overall EU research and innovation efforts

The FP7 is being implemented in a period when European and global research and innovation systems are changing significantly. Recent trends in globalisation represent shifts in networks and allocation of resources, and new players are significantly influencing the overall research and innovation landscape, such as China and India. The business community has embraced a more open approach to innovation in which knowledge is sourced and accessed where it is being produced. New nodes and centres of agglomeration influence the structure of research and innovation systems and their attractiveness for financial resources and talent.

There are few hard facts available to assess the FP7's impact on Europe's research and innovation efforts in a systematic way. But there are several indications that such effects are indeed present. The Expert Group argues that even though the FP7 is defined as a pre-competitive research and development programme, it has some key components that are underpinning innovation processes and capacities. In particular, these include the ways through which entities from different countries and across different sectors collaborate, making up a distinctive feature of dynamic innovation systems. It is also striking that participants from industry, research and higher education collaborate with a high degree of inter-disciplinarity and application orientation. Many national evaluations of participation in FP6 and FP7 point to the importance of network effects and long term impacts which reinforce the overall economic specialisation of national economies and research systems.

The self-assessments by the Commission services also suggest that there is a substantial and varied impact. For example, the ERC suggests that national research councils or agencies are

[78] Technopolis (2010): The impact of the EU RTD Framework Programme on the UK. Brighton, May 2010.

adopting similar funding schemes to the ERC model, and ERC grantees are often offered improved conditions by their host institutions, while ERC applicants are offered national funding. Some FP7 specific programmes have also had structuring effects on national research. One example of ERA articulation is in *People*, with the active participation in the 'European Partnership for Researchers' and the 'Code of conduct for the recruitment of researchers', promoting mobility and better careers for researchers in Europe. The Science in Society programme has also had some remarkable structuring effects on ERA in the field of participatory technology assessment, capacity-building of civil society organizations, and promoting open science in academic journals. *Capacities* is reported to promote direct impact. Assessments of *Cooperation* suggest that collaborative projects are at the core of ERA. The FP7 is assessed to fill in important gaps between national research activities, thus gaining critical mass in many areas and ensuring added value, as the assessments suggest that the FP7 activities are not likely to have been implemented without EU level funding.

It is also likely that some of the new instruments in FP7 are reinforcing the effects on EU research and innovation efforts. In five cases, the European Technology Platforms have led to Joint Technology Initiatives (Innovative Medicines, Embedded Computing systems, Clean Sky, ENIAC (nanoeletronics), and Fuel Cells and Hydrogen). ERA-NETs have had a noticeable impact on coordination of national research funding, and initiatives under the Treaty's Article 185 are expected to have substantial impact. Such initiatives are set up at the European level to address strategic areas where R&D is key to European competitiveness, and represent flexible means to boost leverage from FP7. The prime example is EUROSTARS. Article 185 initiatives, as well as ERA-NETs and ERA-NET Plus are all potentially useful FP7 means of supporting a better coordination of national research efforts. However, it is hard to judge whether the overall effect will live up to expectations and some of the criticism surrounding JTIs, in particular, suggests grounds for scepticism.

FP7 supported infrastructure initiatives are considered to have been successful in supporting ERA. FP7 has contributed to networking of a large number of national infrastructures and opening them to European scientists via the concept of 'Transnational Access'. FP7 has provided a vision for the future of European RIs by harmonising actions among Member States through the ESFRI procedures and in particular the roadmap for RIs. National roadmaps have been developed and many Member States are receptive to hosting European or regional RIs and/or participating in others. Joint efforts to find suitable administrative and legal models and frameworks for research infrastructures will also speed up the engagement of Member States in the ESFRI process. In addition, the RSFF has helped to leverage-in funding for projects.

In sum, the Expert Group finds that FP7 has had tangible leverage effects and exhibits European added value, including complementing the operations of the business community in the European internal market. However, there are still obstacles to be removed and challenges to meet. They include cross-border funding for joint projects or programmes arising out of ERA-NET initiatives. In many cases, there are legal constraints in generating funding pools for joint programmes that may enhance leverage from FP7 activities.

The complexity of FP7 procedures and rules has an inhibiting impact on the participation of industry, in particular the prolonged time horizon of projects. A recent impact assessment of SMEs in FP5 and FP6 suggests that SMEs see the FP as an opportunity to explore promising applications or to enhance their R&D knowledge and do networking. However, FP involvement does little to improve business results, because of the lack of opportunities to

exploit the research results as they are still too pre-competitive to be commercially viable.[79] Lessons from national evaluations also point to the need to engage more large companies in the FP7, as these also have key roles as nodes in national innovative networks. An overall implication for the role of the FP is to reinforce its funding with a view to support leverage and added value e.g. in co-funding Joint Programming Initiatives, mobility and research infrastructures.

## 7.3 Outreach, dissemination and communication to citizens

In general terms, dissemination refers to the access, transfer and commercialisation of the knowledge produced by the public research base for business and policy-makers. Many of the channels for dissemination of FP7 are open, but only a limited amount of material will be flowing into them until more research is completed. Although it is too early to assess the dissemination, communication and policy-related impact of FP7, it is worth noting that most of the specific programmes seem to have devoted increased attention to these types of activities. The little evidence available regarding dissemination of knowledge seems to be positive. In the field of ICT, expectations for knowledge and technology exploitation are relatively high. More than 75% of participants in the JTIs have such expectations. However, the high industrial participation in ICT programmes and the industry-led nature of JTIs is probably behind this result. Other programmes with less industrial participation are likely to have lower ratios.

Communication to potential applicants is done through the Europa and Cordis portals. The participant portal of 'Europa' was created in 2009 and is integrating a series of pre-existing applications like the unique registration facility. These are valuable means of communication, but it is unclear why the two web-portals are kept separate. The CORDIS site should be improved to make it easier for first-time users, with no prior knowledge of the FP7 structure, to find what they are looking for. National contact points are important as channels providing information to potential applicants through information days and small seminars. Meetings of national contact point coordinators were also organised annually. All these activities seem to be well balanced and appropriate.

Communication of results is improving compared with previous FPs in terms of putting efforts to present result of research in final-project conferences, involve stakeholders and potential users in the final phases of projects, and in some cases, the production of policy briefs. It is worth noting the efforts to create practical guides for researchers to help them with communication and societal outreach. Another novelty is the move to create open access via an online repository of peer reviewed papers, with pilots in selected areas of *Cooperation*. While the Expert Group recognises the value of such an approach, it should be carefully monitored to make sure that it does not create conflict between authors and leading journals or put at risk researchers' ability to publish in top journals.

## 7.4 Conclusions on impact

The Expert Group acknowledges the efforts by the Commission to promote effective dissemination and exploitation of FP project results and to ensure that they lead to improved innovation and strengthening of the outcomes of research. Despite some successes, however, the overall impression is that this is a mission which could be reinforced.

[79] Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programme for RTD, op. cit.

Plainly, the challenge of ensuring full and effective exploitation of publicly funded research is not unique to the FP and confronts the participants in, and managers of, all publicly funded research programmes. In the history of FPs, there has been a succession of attempts to instil in participants an awareness of the need for sound planning and exploitation, right from the very start of the research project.[80] Examples of the devices used include the technological implementation plans (TIP) under FP4 and FP5, and the plan for the use and dissemination of knowledge (PUDK) under FP6. There is also a heavy emphasis on the detailed specification of deliverables in the planning of research projects.

On the side of the participants, the picture is of some success combined with lost opportunities. In particular, in the realm of FP projects there appears as yet no standard approach to how the internet is being used as a device for promotion and dissemination. In short while most projects have a website, this is still not mandatory and although some Directorates-General such as DG INFSO, have guidelines for the formats to be used, others do not, compromising efficiency and accessibility.[81] It would also be helpful if it were more transparent who in the Commission is in overall charge of the dissemination of FP7 research results. The operational units managing the different parts of the FP each play a part, but at present it appears the efforts are down to the individual initiatives of the Directors, Heads of Unit and individual project officers to organise this work. The Expert Group concludes that DGs need to establish a clearer strategy and line of responsibility for effective dissemination of FP research results. More imagination and creativity needs to be brought to the task of branding and promoting the FP and its research projects. But the Expert Group also stresses that there has to be sufficient attention to potential impact when setting objectives of calls for proposals.

[80] W. Polt has shown the importance of clearly defined exploitation plans as a prerequisite for effective innovation in FP projects.

[81] The use of the internet was examined in a study for the FP6 Ex post Evaluation, highlighting the overall suboptimal position.

# 8 Conclusions and Recommendations

The Seventh Framework Programme is a major investment in the future of the EU and a significant component of the drive to boost its scientific performance, competitiveness and socio-economic development. There can be no doubt that it is contributing to the realisation of the European Research Area and it has a pivotal role to play in fostering an 'Innovation Union' consistent with the aims of the Europe 2020 strategy. The Expert Group has been impressed by the breadth and ambition of FP7, the integrity with which it is administered and the generally excellent quality of the research that it supports. A vast amount of research funded by FP7 is in progress, and it can confidently be expected to yield outputs and have impacts that will have enduring effects on Europe.

Nevertheless, a balanced evaluation also has to draw attention to shortcomings and to point to solutions that can improve the effectiveness of the programme in its latter years, during which more than half the money allocated to research in the EU's 2007-13 Multi-annual Financial Framework remains to be spent. It is also salient that many of the procedural and administrative changes adopted for FP7 have taken time to be implemented and have scope to be enhanced quickly. It is, therefore incumbent on the Expert Group to put forward proposals for improvements for the final years of FP7, as well as to inform the debate on a successor programme beyond 2013. This section of the report draws together the key conclusions from earlier sections. The Expert Group has concluded that there are a number of broad areas in which FP7 could be improved and these are the subject of the ten key recommendations of this evaluation.

## 8.1 Main conclusions

The relationship between the FP and ERA is crucial to the success of EU research policy. Because FP7 has such a pivotal role to play in advancing the European Research Area, it is essential that there should be clarity in what the Framework Programme is, and is not, meant to encompass, even if it is unsurprising in so vast a programme that there is some fuzziness in objectives.

### 8.1.1 ERA

Among the ERA objectives, the Expert Group finds that:

- Excellence seems to have been at the heart of the great bulk of FP7 funded projects.
- The cross-border coordination of research programmes and priorities has become better, but still faces significant obstacles.
- Europe's standing in world research and openness have been partly addressed and have benefited from the greater weight given to leading-edge research by the specific programme *Ideas*.
- Overall, the impact of FP7 on ERA is positive, but in many respects under-developed, especially in coordination other than explicit Joint Programming Initiatives.

### 8.1.2 The mix of sub-programmes and funding measures

FP7 has several objectives and it is bound to be difficult in so vast a programme to arrive at an optimal mix. On the whole, the Expert Group accepts, and strongly applauds, the evidence that FP7 has succeeded in its goal of promoting excellence. Yet there is an obvious concern that many proposals adjudged to be excellent are not funded and that this, coupled with the substantial effort needed to prepare a proposal, may deter some of the best researchers from

applying. In this context, the Expert Group notes that exploratory work has been undertaken on complementary financial support to FP7 through the EU Regional Policy for Research Infrastructures and Research Potential projects mentioned in the EC Communication 'Regional Policy contributing to smart growth in Europe 2020'.[82]

When considering the balance of resources and areas in the FP7 a conclusion of this evaluation is that research infrastructures and research training deserve more attention and resources, especially to ensure excellence for (and from) the coming generations of European researchers and to enhance a wider human resources capacity building across all Member States and regions of the EU. As an illustration of how such a rebalancing might be achieved, there is a case for shifting funding from some of the less popular actions to the Initial Training Networks within the Marie Curie Actions, since these ITNs have experienced considerable excess demand, pointing to an uncovered need with a truly European added value.

There is always a delicate balance to be struck between persevering with procedures and funding modes that have become familiar to all concerned and the development of novel approaches. Although some of the new instruments appear to be very successful and have been implemented with few frictions, others have elicited criticisms, some of which go beyond mere teething troubles to suggest more fundamental flaws. The proliferation of instruments and programmes has, too, increased the complexity of the Framework Programme from the point of view of the research community, especially industry and SMEs. The Expert Group finds that:

- The specific programmes *Cooperation* and *People* are, broadly, achieving their goals, but where there are criticisms, it is important for them to adapt.
- The ERC appears to be successful in reaching its objectives of excellence and attracting top researchers and can be adjudged to be a valuable addition to the FP portfolio. Its mix of starting and advanced grants is appropriate, but there are reasons to be concerned about the low success rates.
- The RSFF is making a valuable contribution to research capacity, not least by achieving significant leverage of funding from other sources. Taking into account the high level of demand, the second phase of RSFF (2011-2013) should therefore be implemented according to plan. The second tranche of the EC contribution to the RSFF (€500 million), earmarked in FP7, should be released. Monitoring of the RSFF implementation should ensure that sufficient additionality (in the sense that projects supported add to what would have been done in the absence of the support) is achieved.
- Concerning the JTIs, ERA-NET Plus and Article 185 measures, evidence is still scattered. Criticisms have been expressed about the administrative burden, legal difficulties and low reimbursement rates of the JTIs and the fact that separate rules and procedures have been adopted for different initiatives.
- Difficulties have been identified in taking forward different types of cooperation initiatives. Cross-border-funding of initiatives that build on ERA-NETs has encountered problems. In Joint Programming Initiatives, management, decision-making procedures and assembling funding pools have all proved to be hard, and need more imaginative approaches. The Expert Group concludes that these ought to amenable to fairly straightforward solutions, provided the political will is there. The tying together of

[82] European Commission (2010): Regional Policy contributing to smart growth in Europe 2020, COM (2010) 553, 6.10.2010, P.10.

national and EU level funding is especially important in enhancing the leverage effects of FP funding.

- The introduction of many novel funding measures has increased the complexity of FP7, certainly as seen by research performers, and leads the Expert Group to conclude that great caution should be exercised in proposing any further new measures for FP8 until those currently in place have been convincingly evaluated.

### 8.1.3 Implementation

Most of the basic procedures connected to the development of research themes and the selection of projects (elaboration of calls, conduct and probity of peer review, monitoring of gender balance, oversight of ethics) work as well as could be expected. Some thought is needed about the governance of research and about whether there would be advantages in having a sharper division between strategic decisions and implementation. The Commission, working with the Council and the European Parliament should be in the lead on the major political and policy decisions.

However, more of the routine administration and monitoring of projects and implementation could be undertaken by agencies such as the ERCEA and the REA. It is easily overlooked that the REA and the ERCEA were set up during the early years of FP7. In these circumstances, there were inevitably going to be teething-troubles and the potential for difficulties stemming from a lack of experience on the part of agency staff. The Expert Group considers that the emerging division of labour is now functioning reasonably well and that there is scope for further efficiency gains as the significant investments in improved IT come on stream, although more could be done to streamline IT systems.

The advantages of stability in procedures mean that they should, at most, be tweaked rather than radically altered. Otherwise, there is a risk of further disruption from the need for all sides to 'learn-by-doing'.

### 8.1.4 Participation

There has been progress on increasing the participation of women in FP7 and the pressure to include women in different roles has been instrumental in raising the salience of female participation rates, but the conclusion of the Expert Group is that more needs to be done. The Commission could do more to push for a greater inclusion of women in the FP and should exercise leadership in this regard.

The success rates of researchers from some Member States are systematically lower than for others, raising questions about whether the application of the excellence criterion allow sufficient scope for developing the undoubted potential of researchers from these countries. The relative success of a comparatively small number of leading RTOs and (to a lesser extent) major universities raises awkward question about concentration versus spread and scope for new entrants, but the Expert Group has no easy answers.

Overall, while there has been progress, FP7 does not appear to be a sufficient instrument for attracting talent from third countries or for strengthening Europe's international linkages. New strategies for different kinds of partner countries need to be developed.

### 8.1.5 Industry and Innovation

Even though the FP7 should be seen as primarily a framework for pre-competitive research, it undoubtedly has many significant innovation related components that bear directly on competitiveness. These include collaborative projects between industry and science in the specific programme *Cooperation* and new instruments addressing key knowledge areas for industry, such as Joint Technology Initiatives. In addition, the Competitiveness and Innovation Framework Programme (CIP) managed by DG Enterprise and DG Energy is

aimed at stimulating innovation, but it has a limited budget, a rather narrow focus and its connections to FP7 are not well articulated. The Expert Group stresses the need for a better integration between the research and innovation dimensions in light of the new research and innovation strategy being developed by the Commission, but also recalls that education constitutes a third arm of the Knowledge Triangle and should not be neglected. While it is vital to connect FP7 and its successor to the Innovation Union flagship initiative of Europe 2020, other key parts of Europe 2020 also need to be accommodated.

The Commission should support consistently all stages of the innovation processes from basic research, through applied research to market relevant demonstrators. A crucial point is that research is necessary, but not always sufficient for achieving economically significant innovations. Multi-disciplinarity in the innovation and development process has to be increased, and be suitably attuned to market requirements. The involvement of empirical social sciences, business economists, and scientists from different technical disciplines is required. Some shifts towards such integration can be envisaged in the latter stages of FP7, and a drive for greater coherence should certainly be an imperative for FP 8.

The Expert Group finds that the involvement of industry, especially SMEs, in FP7 is far from optimal and manifestly needs some fresh thinking. Companies are faced with burdensome and expensive processes for participation, with complex instruments, aggravated by rules and practices that are often hard to understand. SMEs in rapidly developing science-based industries need to be able to react quickly to market opportunities and developments and are deterred by the lengthy procedures in the Framework Programme, and can struggle to finance cash-flow needs when payments for research are slow. It is, too, difficult for SMEs to take an effective lead in developing research projects.

Framework Programmes require both flexibility and inter-disciplinarity if they are to support dynamic and radical innovation in Europe. They should have a good balance between consensus-based R&D and longer-term, more disruptive R&D. In addition, programmes need to be strongly aligned with current worldwide R&D priorities and reflect technology and market trends globally.

There are already many well explained options for making FP7 more straightforward for industry. The Expert Group also argues that the creation of a flexible, lightweight and well-defined form of sub-contracting or associate partnership would be of benefit to industry.

### 8.1.6 Simplification

The issue most frequently mentioned in the evidence the Expert Group has examined is simplification, and the inescapable conclusion is that, despite the efforts that have been made in FP7 to deal with known problems, the position remains unsatisfactory. Instead, the Expert Group finds that ‘complication’ continues to deter (and exasperate) researchers and, especially, can be a daunting obstacle to effective industry participation.

Lessons appear to have been learned from difficulties identified in the Ex post Evaluation of FP6, and have resulted in several initiatives aimed at simplification of procedures. Some of the innovations in FP7 have been undoubted successes, notably: the Unique Registration Facility, the reduction in the requirement to produce audit certificates, fewer financial capacity checks and the introduction of the Participants Guarantee Fund, and more sensible project reporting requirements.

Equally, there are aspects of the implementation of the Framework Programme that the Expert Group believes should be rapidly improved in the latter years of FP7, as well as to pave the way for an effective continuation of EU research funding in subsequent Framework Programmes.

While recognising that some of the complaints fail to take account of the inevitable constraints associated with the legal framework and financial control, the Expert Group considers that a more radical approach has to be taken, rather than the welcome, but still rather limited incremental improvements that have been enacted so far. Three distinctive explanations for shortcomings in simplification can be distinguished: the constraints imposed by the EU's *Financial Regulation* and the limitations it imposes on flexibility; those that derive from the design of FP7; and choices made by, or management guidelines issued to, operational staff by the Directorates in the Commission (and agencies) responsible for day-to-day administration. Certainly, the evidence of disparities between sub-programmes or themes in, for example, TTG points to the third area as one with substantial potential for immediate improvement.

The Expert Group therefore echoes and reinforces the calls from the Council, the European Parliament and so many other sources for a concerted drive to accentuate simplification. The Group has identified several dimensions of simplification that are adjudged to be unsatisfactory and require attention:

- *Altering the risk/trust balance*: too many of the procedures appear to be designed to ensure a very low risk of delinquent behaviour by grant-holders and thus not to trust them in any way. The effect has been to introduce rigidities and excessive control mechanisms.
- *Further reductions in administrative burdens*: there are many further steps that could be taken, many of them identified in the April 2010 Commission communication and in studies for the European Parliament. Among those that the Expert Group concludes could be most rapidly dealt with are avoidance of duplication in reporting where there are separate funding streams, the issue of interest on pre-payments and simpler reporting.
- *Consistency in implementation*: the Expert Group has found many examples of inconsistencies in the application of rules, both within and between specific programmes, and there is anecdotal evidence of scientific and financial officers interpreting rules differently and giving conflicting advice to investigators.
- *Time to grant* raises questions that need answering. The reasons for excessively long times to grant in some areas need to be sought and remedies found that result in a sharp fall in these times in the worst performing areas. The Expert Group recognises that sufficient time is needed for 'due process' to be carried out, but the systematic differences in TTG between different parts of the *Cooperation* programme and the wide range of times taken suggests that there are shortcomings in management systems and practice that could be remedied.

### 8.1.7 Impact

While it is too soon to ascertain whether FP7 is living up to expectations in terms of outputs and impacts, the evidence provided by two of the supporting experts for this evaluation (Adams and Coatrieux) underscores how European science has been boosted by previous Framework Programmes.[83] In spite of the growing attention to dissemination, exploitation of results and communication to potential applicants, the Expert Group finds that there are important aspects that deserve further attention. In particular, the commercial exploitation of research results for innovative activities continues to be inadequate, notably in areas where there might be opportunities for enhancing Europe's industrial competitiveness. Consequently, more attention should be paid to the channels through which commercial

[83] See also Technopolis (2010), op. cit.

exploitation of research could be enhanced. In addition, the means by which research results feed into wider societal goals and the policies designed to advance them could be improved.

Before the end of FP7 and in good time for FP8, the Commission should undertake a radical rethink of the means for collecting and disseminating information on project results and notably the use of Commission internet portals for promoting FP7 and its results. Open access to scientific publications is a welcome development, but needs to be monitored, not least to ensure that it does not result in sub-optimal dissemination in secondary journals and that standards of refereeing prior to making findings available remain robust.

## 8.2 Specific recommendations

The overview of findings and conclusions set out in the previous section provides broad orientations for recasting FP7 from 2011-2013, while also paving the way for the transition to a new FP after 2013. In this section, we set out ten key recommendations, distinguishing between those with shorter and longer timeframes.

1. **To advance ERA and Innovation Union objectives, integrating the research base** by overcoming fragmentation in research is vital, while simultaneously achieving a sharper division of labour between what is done at EU level and what is undertaken in national programmes. European research and innovation efforts must concentrate on themes where critical mass is vital for success and where breakthroughs require cross-border solutions, while also allocating sufficient resources to R&D topics which promise radical innovations. Addressing the 'Grand Challenges' confronting the European Union should increasingly be at the heart of EU research policy, starting in the last three years of FP7, but more emphatically so in a successor programme. This process could be structured according to who sets the research agenda and to take account of the 'smart, sustainable, inclusive' *leitmotif* for Europe 2020, although they will need to work together to address the 'Grand Challenges' as follows:
    - Science for science – the researchers set the agenda
    - Science for competitiveness – industry sets the agenda
    - Science for society – civil society actors set the agenda
2. **To develop and implement high quality research infrastructures**. Research infrastructures (RIs) are pivotal for the Knowledge Triangle, and as such are a pillar for implementing the ERA, but there needs to be coherence between what is funded by FP7 under the heading of *Capacities*, the ESFRI and capacity building undertaken as part of Cohesion policy and what is being considered in the context of Joint Programming. More effort should be made to boost RIs during the latter stages of FP7, especially the Integrated Infrastructure Initiatives (I3) that have the greatest scope for added value at European level. In addition there should be a focus on promoting their impact by establishing synergies between training instruments and utilisation of RIs and by stimulating industrial and third country access.
3. **The level of funding should, at least, be maintained.** Although the straitened budgetary conditions following the severe economic crisis will mean tough choices have to be made in public spending, the competitive challenges that the EU faces require sufficient investment in long-term economic development and there should be no reduction in funding for FP7 in its latter stages. There is a compelling case for continued substantial funding of research in the Eighth Framework Programme, not least as one of the key tools to achieve the Europe 2020 goals. A reasonable level of funding per year could be that reached in the last year of FP7. In relative terms, this would mean that the percentage of

the total EU budget that FP7 will have when it ends should be regarded as a minimum. Funding at this rate would help to overcome the problem that many individual proposals adjudged to be excellent are not funded which, coupled with the substantial effort needed to prepare a proposal, may deter some of the best researchers from applying.

4. **A well-articulated innovation** strategy needs to ensure that instruments and priorities encourage participation from a broad spectrum of small and large enterprises, universities and research and technology organisations. The research and innovation strategy also has to take into account the need to support European enterprises' efforts to integrate in global innovation networks. The open, international character of the FP7 could therefore be expanded. Specific actions should be taken in the context of the evolving financial crisis to channel financial support for research and innovation to areas of crucial importance for European competitiveness. An increased emphasis on monitoring progress in FP7 projects is needed if the intended impact is to be achieved. Innovation also requires more attention to the distinctive needs of industry, among which reductions in administrative burdens are vital.

5. **Simplification needs a quantum leap**, and the Expert Group calls for all Directorates-General and agencies rapidly to implement the short-term simplification measures recently put forward in a communication by the Commission and to ensure that they are applied rigorously from 2011-13. Coherence of procedures and approaches between Commission DGs and the Executive Agencies responsible for administering FP7 is of crucial importance. The Expert Group proposes that the Commission consider the upcoming revision of the Financial Regulations as an opportunity to create more flexible conditions for research in subsequent FPs. In addition the Group pleads for the Commission to switch from its present low-risk/low-trust attitude to a more trust based and risk-tolerant approach.

6. **The mix of funding measures** in FP7 and successor programmes should strike a different balance between bottom-up and a top-down approaches to research, with greater emphasis in the specific programme *Cooperation* during 2011-2013 on more open calls. It is also important to ensure that education does not become the forgotten side of the Knowledge Triangle and thus that the linkages between research and innovation are adequately complemented by research training.

7. **A *moratorium* on new instruments** should be considered until the existing ones have been sufficiently developed and adequately evaluated, and care should be taken to avoid a confusing proliferation of instruments.

8. **Further steps to increase female participation in FP7 should be taken in its remaining years;** in particular:

   - Measures to boost female participation should be reinforced throughout project life-cycles, paying particular attention to overcoming gender-specific obstacles which women face.

   - The Commission should reinvigorate its approach to promoting female scientists and should aim to galvanise Member States to address gender gaps, especially where female researchers face specific obstacles, while ensuring that it redoubles its efforts to achieve gender balance with a specific strategy for the remainder of FP7. It should accept its responsibilities in a leadership role, with the support of the Member States, to use positive measures for the training of female scientists, including a dedicated scheme under the Marie Curie actions.

- The 40% target for female participation in Programme and Advisory Committees should be sensitively but rigorously implemented.

9. **To pave the way for increased participation from Member States that are under-represented** greater prominence should be given to improved connections between the Structural Funds and the FP. Moreover, within the FP, the importance of the *People* programme for developing the potential for scientists from EU12 should be stressed, as should the scope for using infrastructures.

10. **Opening of the FP7 to international cooperation** is of great value. As other regions rapidly strengthen their research and innovation capacities (with Asia perhaps being the most notable example), but also as the urgency to address global challenges grows, the ability of European research and innovation to link up with other regions, markets and research and innovation agendas and to meet global needs for innovative solutions to grand challenges becomes increasingly important A review based upon a thorough analysis of the current strategy towards international cooperation is needed. The international perspective must be integrated into all programmes and instruments.

# 9 Implications for the goals and implementation of FP8

The Expert Group, having reviewed the evidence on FP7 – even though it is too early to reach any sort of definitive verdict on several key issues – has been struck by the many positive achievements to date. There can be little doubt that the Framework Programme is making a significant contribution to European science and the development of the European Research Area. Consideration of all the evidence presented including exchanges with participants and stakeholders leads to a number of observations and suggestions for FP8.

## 9.1 The likely strategic demands on the FP

A first crucial question is what the underlying demands on a future FP will be. According to the recent Commission Communication on the Innovation Union, Framework Programme 8 (FP8) is expected to support the Europe 2020 strategy which has a range of very ambitious objectives embodied both in the Flagship Initiatives, the headline targets and the governance approach. To do so FP8, in turn, can expect to have to fulfil more (and more ambitious) objectives than those addressed by previous Framework Programmes. In particular, it is clear that a much greater emphasis than in previous FPs will be placed in drawing in industry and achieving improved linkages between research and innovation.

The Expert Group believes that the next Framework Programme has the potential to be a powerful catalyst for societal change and economic renewal in Europe and, if structured and funded appropriately, will be strategic in realising the Europe 2020 objectives. Some of the challenges it faces can, nevertheless, be expected to differ from those that were most prominent in FP7 and previous FPs. In particular, the research and innovation effort in FP8 looks set to be much more focused on the 'Grand Challenges' that confront Europeans – such as climate change, an ageing population, new and intensifying competitive pressures in global markets, a secure and sustainable energy supply, and social cohesion. Research and innovation is widely recognised as having a vital role to play in long-term societal transformations, as well as in supporting necessary but more short-term socio-economic developments.

### 9.1.1 International cooperation

Europe, as has been emphasised in this evaluation has to be open to influences, competition and the scope for collaboration with other parts of the world. It is anticipated that the international dimension of the FP will have developed a new momentum following a strategic reorientation in line with the new global market, science and technology paradigm corresponding to the emergence of the BRIC economies

Equally, it should be stressed that European universities, research institutes, and companies can develop into knowledge and innovation hubs attracting the most talented researchers from all over the world. This could be achieved, in part, through increased and centralised funding which will further support more international collaborative and mutually rewarding research with key strategic foreign partners. The EU should seek stronger links to the emerging economies which are becoming increasingly active in global research and in global innovation networks.

### 9.1.2 Coherence and coordination with Member State research policies

The anticipated demands on Europe's systems of research and innovation will call for a better reconciliation and optimisation of the three policy areas within the Knowledge Triangle (research, education, innovation). Joined-up policy-making is will be needed to achieve

effective linkages between research and innovation, thereby shaping productivity, competitiveness and employment. The research training and education dimensions should be strengthened so as to ensure that scientific excellence and innovative capacity are durably reinforced. In pursuit of these goals, the synergies between EU instruments supporting innovation (CIP, ERDF and FP) need to be more clearly understood and practical options implemented to improve their effectiveness and boost their impact.

There is a widespread recognition that only through EU-wide R&D policies can an open, integrated and competitive ERA be developed. Manifestly, improved co-ordination of research funding between the Member State and EU level is needed. The potential for new European Innovation Partnerships to become effective bodies for policy coordination and to spark further development of mixed-funding schemes such as Joint Programming Initiatives and Article 185 Initiatives should be explored. FP8 will also see a strengthened impetus for participation from the Member States which acceded to the EU in 2004 and 2007 and this will have to be factored into how collaboration patterns develop. This suggests that inclusiveness should be an important watchword for FP8. In this context, it is important to emphasise the leverage effect through which FP support can mobilise funds from public and private actors in the Member States. This development should be strengthened in FP8.

## 9.2 The research agenda and priorities

It is always hazardous to try to map out a research agenda for a programme that will only start after 2013, but some issues are bound to be on the agenda. They are summarised in the following sub-sections.

### 9.2.1 Excellence

- Frontier research is an important driver for long-term growth.
- A strengthened role for the ERC is an important instrument for increasing the science base needed for addressing innovation and societal challenges.
- High-calibre research must allow for risk and, on occasion, the prospect of failure, so that the balance between risk and the scope for highly innovative results should be tilted more towards riskier projects

### 9.2.2 Competitiveness

- Emerging from the global financial crisis, ‘smart, sustainable and inclusive growth’ in Europe has to move from being rhetoric to reality
- To induce more and ‘new’ companies to participate in FP8, the programme should be designed in a way that is sufficiently attractive for them in terms of their own strategic development, taking note of the differing interests and expectations of large companies and SMEs.
- Similarly, Private-Public Partnerships are likely to become an integral part of the European research landscape, and will require adequate and sustained funding from all partners involved, including – where appropriate – the Member States.
- The ‘open innovation’ paradigm deserves to be taken further in FP8, subject to safeguards for the researchers who generate the intellectual property
- Strengthening Europe's competitiveness will require continued and strengthened investments in research and innovation. For this reason, the budget for FP8 should remain at least, as a proportion of the EU budget, at the level reached during the final year of FP7.

### 9.2.3 Societal objectives

- By the time FP8 is launched, there will be visible examples of how the research achievements of FP7 have been translated into impacts that benefit society at large and these should be a starting-point for more ambitious efforts to connect research with societal change.
- Many of the 'Grand Challenges' and their consequences are of immediate importance and interest to citizens who, as taxpayers and ultimate funders of FP8, have a legitimate interest in how the Framework Programme as a whole is formulated and structured. The efforts of the EU Framework Programme in addressing them can only become better and more widely understood if dissemination activities are directed more explicitly towards citizens.
- The dissemination and exploitation of research results is a crucial aspect of successive FPs which needs to be strengthened considerably. It should be incumbent upon the Commission to ensure a substantially improved dissemination strategy, encompassing easy and open access to the results of publicly funded European research.

## 9.3 Design and administration of the new programme

The Expert Group considers that the four components of a research system represented by the four specific programmes in FP7 will remain important in any successor programme. However, the present balance in which collaborative projects account for close to two-thirds of the resources will need to be reviewed. Based on its success to date, an increase in the share of the ERC looks to be warranted and more resources are likely to be needed to enhance research infrastructures. For the latter, whether this means direct funding by the FP, an elaboration of the loan funding approach introduced by the RSFF or pushing for the Structural Funds to contribute more in this regard is an open question.

The alignment of the FP with the EU's budgeting cycle has been a positive development in FP7. It remains uncertain what the duration of the subsequent Multi-annual Financial Framework will be, although the Commission communication on the budget review appears to favour a five+five formula. Such a duration could also facilitate greater continuity in research funding, while also allowing for a stock-taking at mid-point of a new FP.

### 9.3.1 Instruments and measures

The Expert Group has recommended that a limitation be imposed on the introduction of new instruments. For FP8, a possible solution could be to adopt a one-for-one principle in which new instrument can only be introduced if an old one is abandoned. Alternatively, a process for merging different instruments or, if need be, discontinuing some of them should be set up.

Collaborative projects, currently funded through *Cooperation*, have been successful in stimulating cross-border networks between actors from industry, academia, research institutes, and the public sector. Such projects should continue to be prominent in FP8, but might be more focused on Europe 2020 objectives and particularly the 'Innovation Union', albeit with more openness in Work Programmes and a greater scope for bottom-up definition of projects.

To ensure that the education leg of the Knowledge Triangle is given sufficient attention, it will be important to boost the connections between what is now advanced under Marie Curie actions with much closer connections to collaborative research projects and to use of research infrastructures. In parallel, the ESFRI roadmap should continue to guide the implementation of infrastructure investment.

### 9.3.2 Participation

The focus on innovation will need to be accommodated by a rebalancing of participation in favour of industry. In a proportionate way, FP8 will therefore have to reflect the pragmatic needs of researchers and companies and at the same time fulfil the (to be agreed) essential needs of those responsible for financial and legal oversight.

### 9.3.3 Programme administration

The pressures to advance the simplification agenda are such that many improvements should already be in place before the start of FP8. The more congenial research and funding environment induced by such reforms should be immediately evident to potential FP8 participants and it is also to be hoped, even expected, that the current risk-averse culture will have begun to abate. In addition, the Expert Group believes that the Commission should try to ensure that the new Financial Regulations provide more flexible conditions for research and innovation in FP8.

Executive Agencies are likely to be the way forward for much of the basic running of future FPs and the evidence from the present evaluation suggests that there should be a steady increase in the proportion of day-to-day business that is done in such agencies. Equally, the need for sufficient transparency in both policy development and agency decision-making is important. To ensure that administrative processes take account of the diverse needs and expectations of researchers, the FP8 must create forms in which the lessons from the setting-up and operation of the agencies are constantly distilled into good practice and are regularly monitored.

## 9.4 Unfinished business

It is the fond hope of the Expert Group that, among the key recommendations of this evaluation, those on simplification will already be substantially adopted before the start of FP8. This means that credible plans for achieving a much more streamlined implementation of the FP can be put in place without delay. In particular, the Expert Group stresses that early agreement of many of the basics of the administration and implementation can be expected to avert many subsequent problems. Thus, if new tasks are to be delegated to the equivalent of today's Research Executive Agency, sufficient lead-time should be allowed, rather than repeating what happened under FP7 where the Agency only attained autonomy two and half years after the Framework Programme was launched.

There is a compelling case for much more pro-active approaches to a better gender balance in the FP. A target has value, but both as a trend-setter and source of funding, the FP can provide a more decisive lead by identifying pathways to higher female participation and, *in extremis* imposing conditions on recipients of funding. In this regard, there are two audiences to address: the research community itself, but also the Member States more generally. Many of the policy choices that could lead to higher female participation in FP research have to flow from decisions made by Member States about career structures, funding of training and conditions of employment.

While excellence is, correctly, the crucial principle for funding research, it is also important to foster the development and spread of excellence. Training and mobility of researchers manifestly provide important support for capacity building and research infrastructures can help to enhance research performance. But it is important also to consider 'next stages' once some of the basic capacity is in place, suggesting that countering deficiencies in infrastructures at the regional level should be a more prominent objective in FP8. Similarly, the tensions between the natural desire of researchers to want to be associated with the best and most productive research performers have to be reconciled with countering the adverse

effects on home regions of excessive brain drain. The Expert Group recognises that there are few easy answers to these dilemmas, but highlights the importance of confronting them in FP8.

One of the biggest challenges for FP8 as part of a European Research Area will be to optimise the coordination of Member State and EU-level research funding in order to meet the Grand Societal Challenges. This evaluation has highlighted both the achievements and the shortcomings of the current approaches, and it is clear that there remains considerable room for improvement. Political commitment in the implementation of agreed targets and actions is often difficult to obtain, but it is also incumbent on the FP, especially, to provide leadership and to shape the agenda.

# APPENDIX 1 Top 50 participants in FP7

## Table 1 Top 50 participant organisations in FP7 (not including JTI funding)

| Rank | Organisation Name | Country | Participations | EU Contribution (€M) |
|---|---|---|---|---|
| 1 | CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE | FR | 501 | 231,0 |
| 2 | FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V | DE | 331 | 153,1 |
| 3 | COMMISSARIAT A L' ENERGIE ATOMIQUE | FR | 234 | 118,7 |
| 4 | MAX PLANCK GESELLSCHAFT ZUR FOERDERUNG DER WISSENSCHAFTEN E.V. | DE | 238 | 115,4 |
| 5 | THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE | UK | 215 | 97,8 |
| 6 | ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE | CH | 165 | 97,4 |
| 7 | THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD | UK | 176 | 96,7 |
| 8 | FONDATION EUROPEENNE DE LA SCIENCE | SUP | 9 | 93,5 |
| 9 | EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH | CH | 170 | 91,7 |
| 10 | IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE | UK | 175 | 86,9 |
| 11 | UNIVERSITY COLLEGE LONDON | UK | 163 | 81,9 |
| 12 | CONSIGLIO NAZIONALE DELLE RICERCHE | IT | 240 | 78,6 |
| 13 | VALTION TEKNILLINEN TUTKIMUSKESKUS | FI | 148 | 73,0 |
| 14 | KATHOLIEKE UNIVERSITEIT LEUVEN | BE | 163 | 72,1 |
| 15 | DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV | DE | 138 | 67,9 |
| 16 | KAROLINSKA INSTITUTET | SW | 120 | 67,0 |
| 17 | INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE (INSERM) | FR | 139 | 66,8 |
| 18 | DELIVERY OF ADVANCED NETWORK TECHNOLOGY TO EUROPE LIMITED | SUP | 4 | 61,4 |
| 19 | AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS | ES | 210 | 60,8 |
| 20 | THE UNIVERSITY OF EDINBURGH | UK | 116 | 59,3 |
| 21 | EUROPEAN SPACE AGENCY | SUP | 10 | 51,2 |
| 22 | NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK - TNO | NL | 115 | 50,7 |
| 23 | LUNDS UNIVERSITET | SW | 110 | 49,5 |
| 24 | WEIZMANN INSTITUTE OF SCIENCE | IL | 74 | 48,1 |
| 25 | KOBENHAVNS UNIVERSITET | DK | 115 | 47,3 |
| 26 | THE UNIVERSITY OF MANCHESTER | UK | 118 | 46,5 |
| 27 | TECHNISCHE UNIVERSITAET MUENCHEN | DE | 66 | 46,2 |
| 28 | DANMARKS TEKNISKE UNIVERSITET | DK | 126 | 45,6 |

| | | | | |
|---|---|---|---|---|
| 29 | KUNGLIGA TEKNISKA HOEGSKOLAN | SW | 95 | 45,4 |
| 30 | INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM VZW | BE | 81 | 45,0 |
| 31 | JRC –JOINT RESEARCH CENTRE- EUROPEAN COMMISSION | SUP | 118 | 42,5 |
| 32 | TECHNISCHE UNIVERSITEIT DELFT | NL | 97 | 42,5 |
| 33 | CHALMERS TEKNISKA HOEGSKOLA AB | SW | 90 | 41,0 |
| 34 | VERENIGING VOOR CHRISTELIJK HOGER ONDERWIJS WETENSCHAPPELIJK ONDERZOEK EN PATIENTENZORG | NL | 83 | 40,6 |
| 35 | UNIVERSITAET ZUERICH | CH | 78 | 40,5 |
| 36 | THE HEBREW UNIVERSITY OF JERUSALEM. | IL | 77 | 39,8 |
| 37 | UNIVERSITEIT UTRECHT | NL | 89 | 39,6 |
| 38 | UNIVERSITE DE GENEVE | CH | 75 | 39,4 |
| 39 | HELSINGIN YLIOPISTO | FI | 84 | 39,0 |
| 40 | STICHTING KATHOLIEKE UNIVERSITEIT | NL | 65 | 38,3 |
| 41 | EUROPEAN MOLECULAR BIOLOGY LABORATORY | SUP | 50 | 37,9 |
| 42 | INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE | FR | 82 | 37,1 |
| 43 | ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH | SUP | 34 | 36,1 |
| 44 | UNIVERSITY OF BRISTOL | UK | 73 | 35,4 |
| 45 | TECHNISCHE UNIVERSITEIT EINDHOVEN | NL | 72 | 35,4 |
| 46 | THE UNIVERSITY OF SHEFFIELD | UK | 82 | 34,8 |
| 47 | STIFTELSEN SINTEF | NO | 59 | 34,4 |
| 48 | FOUNDATION FOR RESEARCH AND TECHNOLOGY HELLAS | EL | 111 | 34,0 |
| 49 | LUDWIG-MAXIMILIANS-UNIVERSITAET MUENCHEN | DE | 68 | 33,5 |
| 50 | KARLSRUHER INSTITUT FUER TECHNOLOGIE | DE | 94 | 32,7 |
| | **TOP 50 TOTAL** | | | **3101,0** |

## Table 2 Top 50 industry participants in FP7 (not including JTI funding)

| Rank | Organisation Name | Country | Participations | EU Contribution (€M) |
|---|---|---|---|---|
| 1 | DELIVERY OF ADVANCED NETWORK TECHNOLOGY TO EUROPE LIMITED | (UK) | 4 | 61,4 |
| 2 | SAP AG | DE | 29 | 25,7 |
| 3 | PHILIPS ELECTRONICS NEDERLAND B.V. | NL | 40 | 22,3 |
| 4 | TELEFONICA INVESTIGACION Y DESARROLLO SA | ES | 51 | 20,4 |
| 5 | THALES COMMUNICATIONS SA | FR | 37 | 18,6 |
| 6 | SIEMENS AG | DE | 47 | 15,8 |
| 7 | EADS DEUTSCHLAND GMBH | DE | 40 | 14,2 |
| 8 | AIRBUS OPERATIONS SAS | FR | 21 | 13,6 |
| 9 | VOLVO TECHNOLOGY AB | SW | 25 | 13,2 |
| 10 | THALES AVIONICS SA | FR | 14 | 13,1 |
| 11 | PHILIPS TECHNOLOGIE GMBH | DE | 13 | 12,8 |
| 12 | STMICROELECTRONICS SRL | IT | 32 | 12,6 |
| 13 | FRANCE TELECOM SA | FR | 26 | 10,6 |
| 14 | ROLLS ROYCE PLC | UK | 20 | 10,6 |
| 15 | ATOS ORIGIN SOCIEDAD ANONIMA ESPANOLA | ES | 31 | 10,4 |
| 16 | ABENGOA BIOENERGIA NUEVAS TECNOLOGIAS SA | ES | 3 | 10,2 |
| 17 | ROBERT BOSCH GMBH | DE | 22 | 10,0 |
| 18 | IBM ISRAEL - SCIENCE AND TECHNOLOGY LTD | IL | 16 | 9,7 |
| 19 | SNECMA SA | FR | 18 | 9,4 |
| 20 | INFINEON TECHNOLOGIES AG | DE | 21 | 9,3 |
| 21 | BAYER TECHNOLOGY SERVICES GMBH | DE | 11 | 8,8 |
| 22 | ALCATEL-LUCENT DEUTSCHLAND AG | DE | 16 | 8,7 |
| 23 | BRITISH TELECOMMUNICATIONS PUBLIC LIMITED COMPANY* | UK | 17 | 8,5 |
| 24 | VOLKSWAGEN AG | DE | 18 | 8,0 |
| 25 | NEC EUROPE LTD | (UK) | 17 | 7,9 |
| 26 | ELSAG DATAMAT S.P.A. | IT | 23 | 7,9 |
| 27 | CHEMTEX ITALIA SRL | IT | 4 | 7,5 |
| 28 | ALENIA AERONAUTICA SPA | IT | 19 | 7,5 |
| 29 | EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION S.C.R.L. | (BE) | 13 | 7,4 |
| 30 | ISLENSK ERFDAGREINING EHF | IS | 12 | 7,4 |
| 31 | BALTIC ORGANISATIONS NETWORK FOR FUNDING SCIENCE | (FI) | 1 | 7,3 |
| 32 | ELECTRICITE DE FRANCE S.A. | FR | 29 | 7,1 |
| 33 | ARTTIC | FR | 18 | 7,0 |

| | | | | |
|---|---|---|---|---|
| 34 | ACCIONA INFRAESTRUCTURAS S.A. | ES | 27 | 6,9 |
| 35 | AIRBUS OPERATIONS GMBH | DE | 13 | 9,8 |
| 36 | DONG ENERGY POWER AS* | DK | 3 | 6,8 |
| 37 | IBM RESEARCH GMBH | DE | 14 | 6,5 |
| 38 | SAAB AKTIEBOLAG | SW | 11 | 6,4 |
| 39 | FORSCHUNGSINSTITUT FUER MOLEKULARE PATHOLOGIE Ges.m.b.H | AT | 7 | 6,4 |
| 40 | D'APPOLONIA SPA | IT | 27 | 6,3 |
| 41 | UPM-KYMMENE OYJ | FI | 3 | 6,3 |
| 42 | ERICSSON AB | SW | 16 | 6,2 |
| 43 | THALES SA | FR | 19 | 6,1 |
| 44 | ISTITUTO EUROPEO DI ONCOLOGIA SRL | IT | 13 | 6,1 |
| 45 | TELESPAZIO SPA | T | 8 | 6,1 |
| 46 | EVONIK DEGUSSA GmbH | DE | 11 | 5,8 |
| 47 | GREEK RESEARCH AND TECHNOLOGY NETWORK S.A. | EL | 15 | 5,7 |
| 48 | BASF SE | DE | 21 | 5,5 |
| 49 | ENGINEERING - INGEGNERIA INFORMATICA SPA | IT | 13 | 5,4 |
| 50 | CONTINENTAL AUTOMOTIVE GMBH | DE | 5 | 5,4 |
| | **TOP 50 INDUSTRY PARTICIPANTS TOTAL** | | | **532,6** |

## APPENDIX 2 List of Interviewees in meetings of the Expert Group

| Name | Organisation / Directorate General |
|---|---|
| Carmen Mena Abela | DG RTD L4 (scientific culture and gender issues) |
| Jonathan Adams | Director, Research Evaluation, Evidence, UK |
| Jerome D'Agruma | Techspace Aero (ELUBSYS project) |
| Alexandros Arabatzis | Head of Sector DG RTD L6 (Statistics and quality of data) |
| Alain Bravo | Chair of the FP7 ICT programme independent evaluation expert group |
| William Cannell | Adviser DG RTD L (formerly with the European Research Council Executive Agency) |
| Leopold Demiddeleer | President of European Industrial Research Management Association (EIRMA) |
| Nicholas Deliyanakis | DG RTD G1 (Horizontal aspects and coordination of industrial technologies) |
| Andrea Erdei | DG RTD T3 (SMEs) |
| Costas Fotakis | Director, Institute of Electronic Structure and Laser (IESL), Greece |
| James Gavigan | DG RTD C1 (European Research Area policy) |
| Peter Härtwich | DG RTD A6 (Coordination of FP operations) |
| Sylvia Herrmann | Leibniz University (RUFUS project) |
| Chris Hull | Secretary General, EARTO |
| Annamária Inzelt | Director, IKU Innovation Research Centre, Hungary |
| Mats Lungqvist | DG ENTR H2 |
| Ciaran Mangan | DG RTD E4 (Agriculture, Forests, Fisheries and Aquaculture) |
| Erika Mann | Chair of the Risk Sharing Finance Facility (RSFF) independent evaluation expert group |
| Panayotis Moschopoulos | DG RTD B1 (Coordination of national research programmes – Joint programming and major European initiatives) |
| Joerg Niehoff | DG RTD B1 (Coordination of national research programmes – Joint programming and major European initiatives) |
| Theo Papazoglou | European Research Council Executive Agency |
| Kamila Partyka | DG EAC C3 |

| | |
|---|---|
| Hervé Pero | DG RTD B3 (Research infrastructures) |
| Wolfgang Polt | Head of Centre for Economic and Innovation Research, Joanneum Research, Austria |
| Luisa Prista | Head of Unit, DG RTD L4 (scientific culture and gender issues) |
| Seán O'Reagain | Acting Head of Unit DG RTD B1 (Coordination of national research programmes – joint programming and major European initiatives) |
| Bernd Reichert | Head of Unit DG RTD T3 (SMEs) |
| Rob Smart | Wageningen University (MEDIATION project) |
| John Smith | Deputy Secretary General, European Universities Association (EUA) |
| Robert-Jan Smits | Designate Director General DG RTD (now Director General) |
| Luc Soete | Rapporteur of the Risk Sharing Finance Facility (RSFF) independent evaluation expert group |
| Graham Stroud | Director, Research Executive Agency (REA) |
| Pierre Valette | Head of Unit DG RTD L1 (Research in the economic, social sciences and humanities – Prospective) |

# APPENDIX 3 Terms of reference for an expert group on the interim evaluation of the Seventh Framework Programme

## 1. Introduction & overall objective

These are the Terms of Reference for an Expert Group set up by DG Research of the European Commission for the interim evaluation of the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013) (FP7).

**The overall objective of the Expert Group** is to provide an interim evaluation of FP7 according to the questions set out in section 2.2.

Via a combination of **collective and individual work** punctuated by several meetings, the Group will analyse existing evidence including notably the FP7 Progress Report, the annual FP7 Monitoring reports, evaluation and monitoring studies on FP7 and previous Framework Programmes and their Specific Programmes, ad hoc analyses, statistical information and relevant policy documents and reviews.

The Group will prepare a **final report** in which it will provide conclusions and recommendations.

## 2. Mandate, Deliverables and Timetable

### 2.1. Context and Rationale

The EC Seventh Framework Programme Decision provides in article 7(2): "*No later than 2010, the Commission shall carry out, with the assistance of independent experts, an evidence-based interim evaluation of this Framework Programme and its specific programmes building upon the ex post evaluation of the Sixth Framework Programme.*"[1]

The present paper relates to the interim evaluation of FP7. The interim evaluation of FP7 should be completed in October 2010.

Specific inter-institutional and Commission requirements further frame this evaluation; in particular those related to the Financial Regulation[2] and evaluation standards.[3]

This interim evaluation covers the years 2007-2010, a period during which the European research landscape has changed significantly including:

- The size of the EU Budget allocation to FP7 research activities is growing substantially both in real terms and as a proportion of the overall Budget;
- New initiatives to stimulate the European Research Area have been launched;

[1] OJ L412, 30.12.2006, P. 001.

[2] Council Regulation (EC, Euratom) No 1995/2006 of 13 December 2006 amending Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities (OJ L390, 30.12.2006, p. 001) and Commission Regulation no. 478/2007 of 23 April 2007, amending Commission Regulation no. 2342/2002 (OJ L111, 28.4.2007, p. 001).

[3] SEC (2007) 213, 21.02.2007.

– For the first time ever a major support mechanism for frontier research at European level was created with the European Research Council;

– A range of new activities and implementation schemes were introduced in FP7;

– The financial and economic crisis creates a situation where a balanced support to research programmes and sustainable recovery has to be accomplished;

– Research efforts are expected to meet major global challenges, e.g. climate change.

## 2.2. Questions to be addressed

The approach should take into account the overall strategic context for Community actions and in particular the partnership for jobs and growth. Of crucial importance is the need for effective coordination between FP7 and other major policies such as those for regional development and for innovation.

On this basis, the evaluation should address notably the following questions:

**How far has FP7 achieved its general objectives, including those of the specific programmes?**

The evaluation should provide a first look at progress against objectives differentiated across the main research lines of FP7, including early evidence of impacts (socio/economic, policy, environmental, knowledge).

**How can the impact of FP7 and future Framework Programmes on shaping the European Research Area and other major policies be improved?**

– *Are FP7 objectives regarding the ERA and/or other major policies – including those of the Work Programmes- adequately specified and clearly understood?*

– *Are FP7 research activities likely to achieve their objectives as regards the ERA and other major policies?*

– *Is the current level of FP7 funding sufficient and is the internal breakdown of funding adequate in order to achieve its objectives towards the ERA? Do these objectives need to be revisited in light of recent developments, such as the economic crisis?*

– *How effective is FP7 in engaging with and leveraging public and private research programmes and activities of the Member States?*

– *Is FP7 effective in supporting the development of world class research infrastructures in Europe?*

– *Is FP7 effective in terms of knowledge dissemination? Are the FP7 activities sufficiently visible to the public?*

**Does FP7 play an adequate role in positioning Europe on the global map of science and technology?**

– *Does FP7 attract the best and most appropriate researchers and research organisations from all geographical areas of the EU, with an effective balance between the academic, industrial (including SMEs) and research organisation sectors?*

– *Are the "success rates" in FP7 calls adequate to safeguard a sustained participation from excellent researchers?*

– *What has been done and could further be done to ensure that the world's best researchers are involved in FP7?*

– *Does FP7 adequately stimulate the participation of women and young researchers?*

– *Does FP7 support and nurture European centres and clusters of research excellence?*

– *Is FP7 perceived as flagship of research excellence by so-called third countries and what more could be done in this respect?*

– *Does FP7 provide the appropriate tools to foster S&T International Cooperation?*

**Are the novel measures (such as European Research Council, Joint Technology Initiatives, Article 169, ERA-NET Plus, Risk Sharing Finance Facility) efficient with respect to reaching their intended objectives?**

– *Were the objectives of the novel measures clearly specified and have these measures been implemented according to plan?*

– *What are the main strengths and weaknesses of these new initiatives?*

– *What has been the level of demand, take-up and use of the novel measures?*

– *What is the early evidence of their effectiveness?*

– *What can be done to improve their effectiveness?*

**How can the impact and added value of collaborative research that cuts across scientific disciplines, industrial sectors and policy fields be further enhanced with a view to better address large societal challenges?**

– *Has FP7 been effective in supporting truly cross-disciplinary research and how does it compare with other major research funding programmes?*

– *Has sufficient attention been given to large societal challenges?*

– *Is the FP7 structure, its FP7 funding instruments, implementation modalities in particular joint calls, as well as mechanisms for knowledge dissemination and exploitation well adapted to supporting cross-disciplinary research? Are any major changes required?*

– *Has the ERC been effective in supporting cross-disciplinary research?*

– *How adaptable is FP7 to changing research needs and policy priorities and how are stakeholders from science, industry and policy involved in identifying these needs and shaping the priorities?*

– *How effective has FP7 been in ensuring that research outcomes support policy initiatives regarding large societal challenges by communicating research results to stakeholders and policymakers and by establishing interactions between researchers and stakeholders within research projects?*

**To what extent have simplification measures been effective?**

– *Is there an adequate understanding of the meaning of simplification including how it can be measured, is understood by and affects the different stakeholder groups, notably SMEs?*

– *What are the barriers to real change and what is and can be done within the existing framework and rules to address these and which barriers can only be overcome through adaptation of the framework and rules?*

– *What are the respective roles of the key actors, including the Institutions, in securing change?*

– *Have the simplification measures taken been effective?*

– *Is there overall an adequate balance between risk taking and cost of control?*

– *Are there different approaches which could deliver better results?*

**What progress has been made under FP7 concerning the major issues which were highlighted in the FP6 evaluation report as needing further analysis, notably the participation, role and achievements of industry (including SMEs) in the Framework Programme?**

This interim evaluation covers all research programme activities under FP7. The exercise should provide substantive answers to the evaluation questions listed above and come up with recommendations for the future implementation of FP7, clearly distinguishing between those to be realised within the existing legal framework and those requiring a new framework to be adopted by codecision procedure.

The FP7 interim evaluation also assesses the follow-up and implementation of recommendations from previous evaluations.

### 2.3. Deliverables and Timetable

The Group is requested to address to the Commission a report, of maximum 50 pages plus Appendices, which includes an analysis of findings and a set of conclusions and recommendations on the basis of evidence. The main section of the report should be prefaced by a largely self-contained executive summary, not exceeding 5 pages. The report is to be made publicly available on http://ec.europa.eu/research/evaluations.

The Group starts its work in early 2010 and its final report should be addressed to the Commission by October 2010 at the latest.

**Meetings**

The Group will meet up to a maximum of seven times, between early 2010 and October 2010.

Meetings will be held in Brussels and at other locations in the Member States as decided by the Group.

## 3. Operation of the Expert Group

### 3.1. Number, identification and selection of experts

The Group will comprise up to ten independent experts. It will include the relevant expertise to ensure informed analysis on all of the areas covered by FP7 and will also include acknowledged experts in programme evaluation and management.

The independent experts will be appointed on the basis of the following criteria:

– high level of expertise in the fields of research and technological development in particular, as attested by higher education qualifications of at least doctoral level and/or proven by having won prizes and awards at national, European and international level and/or as evidenced by experience and skills which are widely recognised;

– appropriate range of skills in the different fields covered by FP7, combined with the ability to examine science policy questions and analyse the general context (legislative, political, etc.) into which they fall;

– appropriate language skills.

Provided that the above three conditions are satisfied, other criteria are also taken into consideration:

– appropriate balance between academic and industry expertise;

– ability to assess the societal dimension and strategic relevance of the Framework Programme and specific programmes;

– a fair balance between men and women;

– a reasonable balance of geographical origins;

– regular rotation of experts.

Experts are identified from a list, continually updated by an open-ended call for applications (OJ C 305 of 14.12.2006), for the constitution of expert groups assisting the Commission's services for tasks in connection with the Seventh Framework Programme.[4]

### 3.2. Working method

The Chairperson of the Expert Group decides on its working methods; s(he) is however requested to ensure that the Group members and the supporting expertise are best exploited to allow for such in-depth analysis in all the areas covered by FP7. The Group includes a highly qualified rapporteur.

The rapporteur will prepare the final report of this Group, on the basis of all members' written contributions and of relevant material and events identified by the Group members and/or the

[4] https://cordis.europa.eu/emmfp7/index.cfm?fuseaction=wel.welcome

Commission. He/She will highlight and exploit main points of reports presented by experts, create PowerPoint presentations and draft summaries of the discussions held at meetings. In conjunction with Commission staff he/she will interface with the other evaluations of specific FP7 activities (ERC, JRC, ICT programme, JTI and RSFF) and ensure the results are well integrated in the overall FP7 interim evaluation.

The Commission staff responsible for the Expert Group will be in regular contact with the members of the Group and notably the rapporteur to ensure the smooth running of the Group, and they will attend the meetings to provide appropriate information and orientations. Commission staff will also ensure regular reporting on the progress of the evaluation to members of the Interservice RTD Evaluation Network which will serve as a steering group. The evaluation will be designed and carried out in line with the relevant Commission standards for evaluation and subject to the quality assessment criteria.

The rapporteur will take responsibility for preparing (compiling and editing) the Expert Group report, in close cooperation with the other members of the Group. The Commission staff responsible for the Expert Group will also provide input to the production of the report, notably through the collection of factual evidence.

Appropriate independent experts can be invited to participate in one or more of the Expert Group meetings.

### 3.3. Expert support and evidence-base

The Group will carry out its activities through an independent, robust, evidence-based process. This information base is to be made publicly available on

http://ec.europa.eu/research/evaluations.

The Group is assisted by independent supporting expertise in the form of up to 6 evaluation experts which, on the request of the Group, provide independent information and analysis.

A comprehensive set of studies, encompassing monitoring reports, evaluations of previous Framework Programmes as well as Specific Programmes and contextual and methodological analysis, is carried out or commissioned by the Commission and delivered to the Group progressively according to the availability of data from the various activities. The Group may appoint an expert from their midst or among supporting experts to follow the running studies, as appropriate. The studies provide the Group with a knowledge base to support its work.

The Commission will provide the Group with all necessary information, in particular:

– The FP7 Progress Report

– Annual FP7 Monitoring Reports

– Reports from the above mentioned evaluation studies and ad hoc analyses;

– Report from the Ex post Evaluation of the Sixth Framework Programmes (FP6);

– Relevant policy documents and reviews, including the Framework Programmes, the spring reports to the European Council, annual reports on research activities, S/T indicators, benchmarking and mapping data;

– Targeted evaluations and studies carried out by Framework Programme thematic activities, including the Ex post Evaluation of the Joint Research Centre;

– Statistical information on the implementation of the activities.

In addition, national authorities may also provide evidence on national evaluation studies and data, as appropriate. The Commission will organise a meeting, in collaboration with the Member States, involving a range of stakeholders to allow this information to be presented to the Expert Group and to support discussions.

The Group is invited to establish contacts with national experts for the exchange of information and discussion, and with representative bodies across Europe and international stakeholder groups.

The Commission services may, at the request of the Group, convene ad hoc expert meetings on emerging issues.