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The impact of the EU RTD Framework Programme on the UK

Paul Simmonds
James Stroyan
Neil Brown
Andrej Horvath

Table of Contents

Table of Figures

1. Summary of main findings

1.1 Introduction

This report sets out the results of a study to detail the impact on the UK of successive European Framework Programmes for Research and Technological Development (RTD), focusing on the Sixth and Seventh Framework Programmes (FP6 and FP7, respectively) in particular, but linking back to the FP4 and FP5 where relevant data were available.

The Technopolis Group carried out the study on behalf of the International Science and Innovation Unit within the Department for Business, Innovation and Skills (BIS), as one of several key inputs to its preparatory thinking on the forthcoming Framework Programme.

The overall objectives of the study were to:

- Determine the extent to which successive Framework Programmes (FPs) have leveraged areas of UK strength and helped to introduce new areas of expertise
- Provide evidence as regards the nature and extent of the impacts of UK participation

These two over-arching questions, about FP leverage and impact, were addressed through consideration of nine subsidiary topics, specifically the:

- Extent to which FPs 4-7 have leveraged areas of UK research strength
- Degree of alignment between FP priorities and UK research strategies and funding
- Extent to which key UK research groups are involved, and reasons underlying non-involvement
- Extent to which FPs are supporting gaps in UK funding, helping to strengthen these areas
- Main impacts of the FPs on UK research capabilities, skills and careers
- Main impacts of the FPs on UK industrial development and competitiveness
- Main impacts of the FPs on UK policy development and national RTD funding
- Main impacts of the FPs on collaboration between UK researchers & their counterparts abroad
- FP mechanisms most strongly associated with positive impacts / benefits

The methods employed in carrying out the study included a register-based analysis of involvement in FP6 and FP7, a questionnaire survey directed to every UK participant, for both programmes, and a series of semi-structured interviews with stakeholders. The latter encompassed senior officials from interested government departments, research councils and the national FP support network as well as senior figures from across the research base, in the public and private sectors.

The nine study questions are used to structure the main findings, set out in the subsequent sub-sections, following a very short preamble about the Framework Programme.

1.2 EU Framework Programme for Research and Technological Development

The Framework Programme is the EU's main instrument for funding research that is European in ambition and scope, and which is funded in order to realise a more globally competitive business community and to underpin more robust policy, at the EU-level in particular. The current Framework Programme is referred to almost universally as FP7, a convention that has been followed throughout this report.

FP7 will run for a 7-year period between 2007 and 2013, with the European Commission (EC) investing more than EUR 50 billion in as many as 10,000 European projects of one kind or another. It marked a significant escalation in Europe's commitment to research as a critical platform to support increased innovation and a dynamic knowledge based economy. In practical terms, FP7 has almost twice the annual spending power of its predecessor, FP6.

1.3 The extent to which successive FPs have leveraged UK research strengths

With an average annual EC budget of more than EUR 7 billion, FP7 will expend sufficient sums to produce some degree of financial leverage across most if not all areas of research where the UK, and many other EU member states, has an active interest.

UK income from FP7 is on target to exceed £500 million a year, which is a very substantial amount of money in absolute terms, and is approaching 10% of the national science budget, equivalent to the spending power of a medium-sized research council.

Financial leverage has become ever more apparent with the gradual expansion in FP budgets over time, and especially so with the transition from FP6 to FP7 when the annual EC budget has almost doubled in simple cash terms.

Participants and stakeholders stated that more often than not it is national strengths that shape FP participation, rather than vice versa. It is the breadth and depth of UK research strengths that determine the community's ability to consistently secure a disproportionate share of EC income. This view as to the direction of causality is confirmed by participation and income profiles, with the UK research community securing close to double the share of total EC income one might expect, based on the size of the economy, in all of those FP areas with a strong 'science' quotient: inter alia, the European Research Council, Life Sciences, Marie Curie and Research Infrastructure.

Moreover, national research councils, and other funders, were unanimous in their expressed opinion that the FP had never shaped their organisation's national research priorities or budgets.

There are two programme-level areas where the FP has provided significant financial leverage to national efforts, which are the SME-specific measures and the Marie Curie Actions (MCAs). In the case of the former, the UK has few options for intermediary organisations seeking to carry out research relevant to a large cross-section of businesses and particularly club research for smaller businesses (SMEs) with little or no in-house research capacity. The Grant for R&D and the R&D tax credits for small firms do not reach this particular community and nor do the various innovation advice or voucher schemes. Moreover, the country's many industry research associations have become much smaller as the larger players in almost all sectors – from electricity to water – have reduced their total R&D expenditure. The substantial funding and reach of Marie Curie amount to a very significant expansion in national support for studentships in particular, with all that means for the dynamism and sustainability of leading research groups.

The participant survey also revealed that the FP provides funding for projects in a large number of specialist subjects that national programmes choose not to fund, on the grounds that they are insufficiently important to warrant targeted support. There are just a handful of instances (c. 1% of 1200+ responses) where participants report the FP as having helped to bootstrap national capability, and where people continue to rely upon FP and other non-national funding sources.

In addition, the participant survey found, in a majority of cases, that FP awards had helped to secure new research grants or other follow-on-funding. In this sense, there is evidence of leverage on the output side too. Research council officials and senior academics confirmed this view, with most interviewees confident that any peer review would credit a major FP contract. However, interviewees did not believe FP contracts were held in higher regard as compared with a national research-council grant. Interviewees did not believe that FP awards were changing the shape of the UK's research landscape in any general sense, attracting other investors or research groups to FP teams or topics and away from other priorities. At an aggregate level, national research groups with an established international reputation and a history of frontier research do far better in Framework calls than do younger research groups with a less well-developed profile.

Several smaller businesses stated that FP income was critical to their proprietary research programmes and, moreover, that the awards had stood as testimony to the good sense of their strategy, even occasionally helping to secure secondary investments. Larger businesses did not report similar outcomes with regard to FP contracts signalling excellence to external funders, although in a single case a senior engineer did state that her FP award had helped to convince internal budget holders to increase their financial commitment to the area in question, where they had not been persuaded of the business case previously.

1.4 Strategic alignment between the FP and national strategies

Overall, there is good alignment between FP priorities and UK national research and innovation strategies, with both expending significant sums annually in a wide-range of broadly similar fields, from advanced materials to healthcare to renewable energy.

Strategic alignment has improved through time, particularly with FP6 and FP7. This has arisen as a result of evolution within the Framework Programme, rather than changing UK priorities. Most notably, with FP7, the Commission extended the FP remit to include basic research, ear marking around 15% of its budget for blue-skies research, to be overseen by the European Research Council. Elsewhere the Commission had been experimenting with more flexible, programmatic instruments, where participants and member states play a fuller role in determining research agendas and investment portfolios. The European Technology Platforms and ERANETS are both cases in point, and there is strong interest in the proposed Joint Programming method. Topically, successive FPs increased support for social science research and latterly for humanities research, two areas where the UK has strong domestic interest.

There were two aspects where alignment appeared to be less good, and which perhaps constitute an opportunity for discussions between BIS and the Commission.

The first relates to the balance of investment across the thematic / sectoral priorities, with a very substantial proportion of total FP spend being devoted to automotive- manufacturing- and ICT-related technologies, all areas where the UK has a very much smaller economic base, proportionately, compared with its continental counterparts. There has been much lower levels of support for work in areas where the UK economy has particular strengths, namely high-value services, or an especial policy interest, namely innovation in public services.

The second point of difference was the UK's much sharper focus on outcomes. The FP in most areas continues to be heavily front-loaded in procedural terms, divining priorities at something approaching a project level and committing most of its administrative resource to contracting and financial management and control.

1.5 Participation of key research groups

A majority of the UK's universities, research institutes and research-active companies is involved in Framework. Moreover, most *dedicated* research organisations, from national research institutes to private labs, have been involved actively in Framework over many years, and in many cases stretching back beyond FP4.

The composition analysis revealed that, in numerical terms at least, private commercial organisations make up a majority of UK participants, with more than 600 unique, UK-resident private companies involved in FP7, or 67% of the total participants to date. The equivalent figure for FP6 was 1,150 or 44% of all participating organisations. While this figure is dwarfed by the 2 million or so VAT-registered businesses resident in the UK, it is comparable to the 850 businesses reported in the annual Industry R&D Scoreboard, published by BIS, and the 1,500 or so research-active businesses recorded in the database of the Technology Strategy Board. The equivalent FP6 figures for HEIs and research institutes were 453 and 337; numbers that suggest the very great majority of all public-sector research organisations had been involved in some degree with the FP in the recent past.

When one switches from an analysis of the distribution of participating organisations to an analysis of 'participations,' the picture changes somewhat, and UK businesses account for around 20% of all participations as compared with around 60% for UK HEIs.

Running somewhat counter to current perceptions, the aggregate statistics show that UK business is as extensively involved in the FP as are its counterparts elsewhere in Europe, however the intensity of engagement is somewhat lower on average. UK business participations compare well with the equivalent statistics for France and Germany, however, UK firms do account for a lower share of total national FP income, compared with other leading EU member states.

The picture alters as one increases resolution, with much more variability across business sectors, with evidence of strong involvement by leading UK players in several economic sectors (e.g. aerospace, chemicals, utilities), while in several other notable technology sectors very few of the

leading businesses were involved in FP6 (e.g. food, general industrials, software and telecommunications).

Explanations for non-involvement were somewhat tentative, with interviewees suggesting that the primary reasons were twofold: the relatively high cost and bureaucratic rigidities of the FP, as compared with the cost-to-income ratio of national funds; and the slow metabolic rate of the FP, as compared with national schemes, which is frustrating on the one hand, but can also render the scheme inappropriate on the other, when interests are time-limited. This appears to be particularly challenging for businesses and for policymakers.

1.6 Support for gaps in UK funding

The UK science and innovation system is large and broad-spectrum, and as such there are no major thematic areas where the FP is active and the UK not.

The participant survey provides a more fine-grained perspective on the question of funding gaps, with almost all respondents (94%) stating that the FP does address gaps in national provision in some degree. Almost 40% suggested that this reflected the FP's international instruments and geographical reach. FP support for international research represents a manifold increase in available funds, compared with the UK's domestic portfolio of international schemes. A majority also noted that the FP had augmented national funds, supporting work in a specialist sub-field that the person in question deemed to be important.

In a small minority of cases, respondents argued that historical strengths / interests of researchers elsewhere in Europe, around nuclear power, certain vaccines, aquaculture and fisheries, for example, have attracted FP support over many years, which had provided smaller UK communities with access to both scarce research funding and much bigger and stronger pools of capability. In several cases, respondents expressed the opinion that this had helped to strengthen national capacity in those areas.

1.7 Impacts of the FP on research capabilities and careers

Overall, two motives for participating in FP stood apart from all others, which were access to funds and access to European networks, where, in both cases, around 90% of all 1,200 survey respondents rated these objectives as being important or very important. Universities and research institutes gave most weight to research income, while businesses and others gave most weight to new relationships.

The survey revealed that more than 60% of participants judge the FP to have had a big impact on the nature and extent of their international relationships and networks, while around 55% judge the FP to have had a high impact on their knowledge base. Some 40% judged the FP to have increased their scientific capabilities.

Participants cited a long list of other welcome achievements, from increased scientific reputation to an improved ability to attract and retain worldclass researchers. There was a similarly positive reaction as regards the impact on researcher careers, with around 30% of all respondents stating that their involvement in the FP had had a high impact on career progression.

Participants and stakeholders reported that the FP has had a positive impact on the attitudes, outlook and connectedness of individual researchers, as well as serving as a training ground for project management and administration.

There was a widespread belief that these immediate benefits would produce longer-term impacts in the guise of more consequential or productive research. Participants and stakeholders pointed to instances where an international scope had permitted an approach that a national programme would have struggled to match (e.g. larger and more robust control groups). There were also instances where an international project was deemed to have the spending power to progress understanding more quickly and more confidently than even a large, national science system might afford; and where expanding the geography had enlarged the pool of worldclass researchers to critical mass that might not be replicable nationally.

1.8 Impacts of the FP on UK business capabilities and competitiveness

The FP funds research to underpin the global competitiveness of European businesses, and so it should come as no surprise that a majority of UK business participants stated that their involvement (in FP6, for the most part) had yielded important commercial benefits.

In terms of immediate project outputs, a significant proportion of business respondents reported having made or gained access to new or significantly improved tools or methodologies and in a large minority of cases, firms reported the creation of formal elements of intellectual property.

Beyond these immediate project results, around 20% of businesses stated that their participation had made significant contributions to the development of new products and processes and in around 10% of cases organisations reported increased income and market share.

The study has not been able to establish the extent to which the FP has underpinned improved competitiveness of the wider business community, through for example, knowledge spillovers. Framework would appear to have been of especial importance to the commercial wellbeing of various UK intermediaries, private laboratories and technology consultancies. One might reasonably expect these 'knowledge carriers' to be sharing the benefits of FP-derived know how and methods with their clients.

Lastly, company interviews suggested that FP participation had made a significant contribution to the competitiveness of leading players in several niche technology markets, from inkjets to photonics.

1.9 Impacts of the FP on UK policy development and research funding

The FP is required to fund research relevant to policy and our surveys and interviews confirmed that projects involving UK partners were producing a significant amount of policy 'benefit.'

Around 10% of the participants responding to the questionnaire survey stated that their FP project, or projects, had influenced specific policies or regulatory frameworks, through a range of different channels, from on the one hand the creation of new reference data or models for application within risk assessment methodologies specified in policy papers or regulations, to the provision of evidence that changed the scope of particular policies or fed into enforcement actions. These contributions tend to be highly particular in nature and one of many tens of factors that might ultimately bear on a new or improved policy.

Turning to the stakeholder interviews, UK policy makers were unanimous in their support for the FP, and together they listed a range of important types of benefit:

- Stronger relationships with one's counterparts around Europe, whereby when pressing questions arise that have an international dimension meaningful multilateral conversations can be held within a matter of days
- An increase in the volume of research funded in areas of national policy interest, but which are not the highest priority and as such warrant little or no domestic research expenditure
- An increase in awareness regarding overseas colleagues' priorities and research programmes, which does lead to ad hoc knowledge transfer
- An ability, from time-to-time, to more readily address research questions one might struggle to progress nationally

1.10 Impacts of the FP on collaborations and knowledge transfer

It is hard to imagine that participation in FP projects would not improve an organisation's ability to collaborate with research institutions or businesses in other countries. The participant survey suggested that this was indeed the case, with 45% of all respondents stating that the experience had had a large, positive impact on their ability to work successfully with universities or businesses outside the UK. As noted already, a majority of respondents also reported Framework as having had a significant positive impact on their knowledge base and technological capabilities.

Stakeholder interviews suggested that the knowledge transfer aspects might not be as strong as the statistics suggest, with a significant minority of contributors noting a tendency for the larger,

integrated projects to be conducted in a somewhat fragmented fashion as largely discrete, smaller projects with limited interaction and knowledge exchange.

1.11 Impacts and instruments

The study was unable to establish a line between particular FP instruments and the scale of their respective impacts. Participants and stakeholders did express strong preferences for particular instruments, although this tended to reflect 'fitness for purpose' and administrative efficiency to a much greater extent than the fruitfulness of the instrument in question.

On balance, it seems that UK stakeholders – officials and participants – value two things above all else from amongst the FP's portfolio of instruments: they like the scale and scope of the work that can be supported through the FP; and they like the growing number of bottom-up instruments that permit stakeholders – whether policy makers, research councils or businesses – to get involved in programme- or project-scale activities that fit their priorities exactly.

The addition of the ERC was also very widely endorsed by policy teams, research funders and academic groups, although not by businesses or RTOs which saw this extension as a major financial and intellectual distraction from Europe's competitiveness issues.

The great majority of respondents expressed a strong preference for the medium-sized research projects that had been the mainstay of the FP5 and FP6 programmes, the so-called Specific Targeted Research Projects (STREPs). Several contributors argued that having the ability to launch, very large integrated projects was of great value, however the arrangements were being over-used: in many cases, research questions do not require investments running into the tens of millions of Euros nor do they work efficiently across partnerships with 20 or more member organisations.

1.12 Future development and opportunities for improvement

The study focused on strategic questions in the main: the degree of alignment with national science and innovation policy or the strategic added value of the FP. However, almost everyone contacted during the course of the study did wish to offer a series of observations about the operational aspects of the FP and in particular that while much good progress has been made, it continues to be unnecessarily bureaucratic, costly, inflexible and slow.

When asked about possible future developments and opportunities for improvement in relation to the FP, most focused on explaining negative issues experienced through their participation, rather than providing actual 'recommendations' for improvement. Nevertheless, some suggestions for improvements to FP8 were identified, which might enhance UK involvement and benefits derived. These focused, at the European level, on further developing the themes and types of research supported and reducing the level of bureaucracy. At the national level, suggestions focused on exploring possibilities for inputting to FP scheme design and agenda setting; and providing more intensive support to applicants.

1.13 Conclusions and recommendations

1.13.1 Overall

Overall, UK performance within the FP, in terms of participations and income, has been strong across the period since FP4, and FP6 saw a recovery from a relative low-point in FP5, a level of performance that appears to be holding up well in the early calls of FP7.

1.13.2 Leverage

With an average annual EC budget of more than EUR 7 billion, FP7 will expend sufficient sums to produce some degree of financial leverage across most if not all areas of research where the UK has an active interest.

It is the breadth and depth of UK research strengths that determine the community's ability to consistently secure a disproportionate share of EC income, with the UK securing close to double the share of total EC income, based on the size of the economy, in all of those FP areas with a strong 'science' quotient: inter alia, the European Research Council, Life Sciences, Marie Curie and Research Infrastructure.

There are two programme-level areas where the FP has provided significant financial leverage to national efforts, which are the SME-specific measures and the Marie Curie Actions (MCAs). In the case of the former, the UK has few options for intermediary organisations seeking to carry out research relevant to a large cross-section of businesses and particularly club research for smaller businesses (SMEs). Similarly, Marie Curie amounts to a very significant enlargement of national funds for studentships in particular.

At a project level, the FP provides funding for a large number of specialist subjects, which national programmes choose not to support. There are just a handful of instances where the FP has helped to bootstrap capability, in the absence of significant national investment.

FP awards had helped to secure new research grants or other follow-on-funding. However, FP contracts are not held in higher regard than are research-council grants, and seem unlikely to change the shape of the UK's research landscape, attracting other investors or research groups to FP teams or topics and away from other priorities.

FP income is perhaps most critical to research-active SMEs, funding their proprietary research programmes and signalling the quality of their work to secondary investors.

1.13.3 Strategic Alignment

UK and FP strategic alignment is good overall, and has improved over time across successive FPs with the extension of its thematic priorities (e.g. to include issues from security to the humanities), the addition of various new instruments to the FP toolkit with a stronger bottom-up quality and the inclusion of research excellence principles through the ERC.

The strategic fit looks as though it might improve further in future, with the Commission Services' interest in strengthening links between research and innovation on the one hand and using a series of Grand Challenges as a means by which to inspire and structure at least part of the programme.

The key alignment issue for the future would seem to revolve around the balance of spend across priority areas, and specifically identifying any opportunities to increase the funding available for areas of particular interest to the UK such as high-value services or public-sector innovation.

1.13.4 Key research groups

A majority of the UK's universities, research institutes and research-active companies is involved in Framework. Moreover, most *dedicated* research organisations, from national research institutes to private labs, have been involved actively in Framework over many years, and in many cases stretching back beyond FP4.

Private commercial organisations make up a majority of UK participants, with more than 1,100 UK-resident companies involved in FP6, or 44% of all participating organisations. The equivalent figures for HEIs and research institutes were 453 and 337; numbers that suggest the very great majority of all public research organisations had been involved with the FP.

Running somewhat counter to current perceptions, UK business participations compare well with the equivalent statistics for France and Germany, however, UK firms do account for a lower share of total national FP income, compared with other leading EU member states.

The picture alters as one increases resolution, with much more variability across business sectors, with evidence of strong involvement by leading UK players in several economic sectors (e.g. aerospace, chemicals, utilities), while in several other notable technology sectors very few of the leading businesses were involved (e.g. food, general industrials, software and telecommunications).

Explanations for non-involvement were twofold: the relatively high cost and bureaucratic rigidities of the FP; and the slow metabolic rate of the FP, which can render the scheme inappropriate when interests are time-limited. Timing is particularly challenging for businesses and for policymakers.

1.13.5 Support for funding gaps

The UK science and innovation system is large and broad-spectrum, and as such there are no major thematic areas where the FP is active and the UK not.

FP support for international research represents a manifold increase in available funds, compared with the UK's domestic portfolio of international schemes.

In a small minority of cases, historical strengths of researchers elsewhere in Europe, around nuclear power, certain vaccines, aquaculture and fisheries, for example, have attracted FP support over many years, and helped to sustain some national capacity in those areas.

1.13.6 Impacts on research

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.

Other notable outcomes include increased scientific reputation, an improved ability to attract and retain worldclass researchers and a positive impact on researcher careers. Lastly, FP has had a positive impact on the attitudes, outlook and connectedness of individual researchers, as well as serving as a training ground for project management and administration.

These immediate benefits should produce longer-term impacts in the guise of more consequential or productive research.

1.13.7 Impacts on business

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.

Framework would appear to have been of especial importance to UK intermediaries, private laboratories and technology consultancies. One might reasonably expect these 'knowledge carriers' to be sharing the benefits of FP-derived know how and methods with their clients.

Lastly, company interviews suggested that FP participation had made a significant contribution to the competitiveness of leading players in several niche technology markets, from inkjets to photonics.

1.13.8 Impacts on policy

There is scant evidence of specific impacts on UK policy, however UK government departments and agencies have benefited from the FP in various ways, but in particular from:

- Stronger relationships with their counterparts around Europe
- An increase in the volume of research funded in some areas of policy interest
- An increase in awareness regarding overseas colleagues' priorities
- An ability to more readily address questions one might struggle to progress nationally

1.13.9 Impacts on international relationships

The FP has had a large, positive impact on UK researchers ability to work successfully with universities or businesses outside the UK, however knowledge exchange might not be as strong as the statistics suggest, with a tendency for work to be conducted in a somewhat fragmented fashion as largely discrete, smaller projects.

1.13.10 Impacts and instruments

The study was unable to establish a line between particular FP instruments and the scale of their respective impacts. Participants and stakeholders did express strong preferences for particular instruments, although this tended to reflect 'fitness for purpose' and administrative efficiency to a much greater extent than the fruitfulness of the instrument in question.

On balance, it seems that UK stakeholders – officials and participants alike – value two things above all else from amongst the FP's portfolio of instruments: they like the scale and scope of the work that can be supported through the FP; and they like the growing number of bottom-up instruments

that permit stakeholders – whether policy makers, research councils or businesses – to get involved in programme- or project-scale activities that fit their priorities.

1.13.11 Opportunities for change

The biggest challenge would seem to relate to the issue of widening participation outside the areas where UK universities and research institutes have been so successful: life sciences, ERC, Marie Curie, Research Infrastructure.

This relates to business engagement in particular, with whole swathes of businesses seemingly unaware of or indifferent to FP. Moreover, comparing participation data with income statistics suggests UK businesses have been playing secondary or otherwise less intensive roles than their counterparts elsewhere in Europe.

Chasing more business involvement is a difficult game, and short-term success can cause long-term damage, as people are persuaded, against their instincts to get involved in activities that are not wholly suited to them.

With that cautionary note in mind, there are perhaps three things BIS might give more thought to:

- Encouraging the Commission to spend a greater share of its total budget through its more flexible instruments
- Exploring ways to make more and better use of larger / experienced organisations to bring new organisations into the scheme
- Pulling together more evidence and in-depth case material on the benefits of participation

In terms of national arrangements, we recommend BIS look at three issues:

- The overall PCM, expert and NCP arrangements, to determine whether things have become too fragmented and uneven in terms of available support
- The market intelligence (and FP information more generally) that is available to the national support system, and its adequacy in terms of determining an overarching strategy and informing efforts to hold conversations with the unaware and the sceptical
- The addition of an FP / international chapter in the strategies and annual reports provided to BIS, by the research councils and other public bodies

In terms of the future and FP8, we have to follow the popular vote and recommend that BIS:

- Continue to promote the simplification agenda
- Push for inclusion of broader innovation issues
- Push for early elaboration of the purpose, shape and balance of important new concepts like Grand Challenges and Joint Programming
- Explore ways in which it might encourage the Commission to implement more flexible, trust-based contracts, or grants, as the most appropriate vehicle for international applied research
- Push for an increased focus on research results and outcomes as a means of control

2. Introduction

This report sets out the results of a study to detail the impact of the EU RTD Framework Programmes (FP) on the UK, which was carried out by the Technopolis Group on behalf of the Department for Business, Innovation and Skills (BIS).

The study was commissioned to inform the UK position in forthcoming discussions regarding the priorities and organisation of the next FP, commonly referred to as FP8, as well as to provide intelligence of wider relevance on the added value of European-level activities. The overall objectives of the study were to:

- Determine the extent to which successive FPs have **leveraged** areas of UK strength and helped to introduce new areas of expertise; and
- To provide up-to-date evidence as regards the nature and extent of the **impacts** of UK participation

The full list of questions is set out in the description of the study design and methodology, which follows in the next section. The methods employed in carrying out the study included desk research, a participation analysis of UK involvement in FP6 and FP7 to date, a questionnaire survey directed to all UK participants in the two programmes, and semi-structured interviews with stakeholders.

The report is organised in six further sections, as follows:

- **Section 3** summarises the **methodology** employed in carrying out the study, beginning by outlining the terms of reference for the study and then setting out the methods used;
- **Section 4** presents the main findings from the **desk research** used to test the alignment between the FP programme's topical priorities and instruments and UK research strategies;
- **Section 5** presents the main findings from an analysis of the UK's **participation** in FP6 and FP7 based on data supplied by BIS from the European Commission's E-CORDA database;
- **Section 6** presents the main findings from a **questionnaire survey** of UK participants in FP6 and FP7, which sought a community-wide view of FP added value; and
- **Section 7** presents the main findings from **interviews** from across the spectrum of stakeholders, from programme committee delegates to research funders to businesses.
- **Section 8** presents our **conclusions and recommendations**

A series of **appendices** provide additional information on methodology, questionnaire design and contributors.

3. Methodology

3.1 Introduction

This section begins by outlining the aims of the study and the main questions to be addressed, before going on to introduce the programme of work and the methods employed. A more detailed explanation of the methodology is presented in Appendix A .

3.2 Study terms of reference

The main aim of the study was "to produce up-to-date evidence as regards the impact of the Framework Programmes in the UK such that it can inform, in a timely way, the formulation of UK objectives for the negotiation of FP8." The study was also intended to complement the BIS international team's wider efforts to gain strategic intelligence through extensive bilateral discussions and ongoing analysis of new FP evaluations and impact assessments.

The specific objectives of the work were presented in the form of a number of questions, organised under two broad areas of interest: (i) leveraging / enhancing UK capabilities, and (ii) impacts of UK involvement in FPs. The full set of questions outlined in the Invitation to Tender are presented in Appendix A , but covered the following main areas:

- Extent to which FPs 4-7 have leveraged areas of UK strength
- Alignment between FPs and national strategies and funding
- Extent to which key UK research groups are involved in FPs
- Extent to which FPs are supporting gaps in UK funding / capabilities
- Impacts of the FPs on (i) UK research capabilities, skills and careers, (ii) UK industrial development / competitiveness, (iii) UK policy development and RTD funding, and (iv) collaboration between UK academic and industrial communities
- FP mechanisms most strongly associated with impacts on UK research / industrial capabilities
- Recommendations for enhancing FP alignment and involvement in future

The Invitation to Tender envisaged a methodology that would use both qualitative and quantitative methods, requiring desk research and contact with previous participants in FP (among others). The resulting report was expected to include a set of conclusions that would help BIS to identify thematic priorities and ways in which FP8 could be structured to better align with UK research and innovation systems and increase UK take-up and success rates.

3.3 Methodological approach

The study was designed to address the overall aims and objectives, and to provide answers to all of the questions set out above. The methodology was quite conventional, using several familiar data collection strategies and analytical techniques to produce a mixture of quantitative and qualitative data with which to answer the key questions. The combination of methods included desk research to compile factual data on FP participation, sufficient to map trends across successive programmes and across the many and various target groups, a community-wide online survey to 'count' and profile the spread of opinions on key issues from statistically significant numbers of participants and semi-structured interviews to explore in a more prospective fashion any lessons past experiences might hold for future aspirations. The 3-month timetable prohibited deployment of more novel methods, wherein we had to forego an idea to use bibliometrics to measure the relative quality of research outputs that tie back to FP contracts, as compared with the total body of work in a given field, both national and international. Social Network Analysis had to be discounted for similarly practical reasons, although this technique does have the power to map the nature and extent of international research alliances, and their evolution through time, and it can yield such a view several years earlier than an equivalent citation analysis. This mixed methods approach is described in full in Appendix A , and comprised the following elements:

- A kick-off meeting between BIS and the study team to discuss and finalise the study

- A period of desk research into existing data and strategies in order to assess the alignment between FP support and UK academic/industrial research strengths and priorities. The main findings from this analysis are summarised in Section 4 of the main report
- A factual analysis of UK participation in FP6 and FP7, covering participation in proposals, success rates, and participation in funded projects. The outputs from this component of the study are presented in full in Appendix B (for FP6) and Appendix C (for FP7). The main findings are also summarised in Section 5 of the main report. An additional analysis of available data and information on UK involvement in other related initiatives (not covered by the E-CORDA database) was undertaken and is presented in Appendix D , with the main findings summarised in Section 5.12
- A questionnaire survey of UK participants in FP6 and FP7. Technopolis designed a questionnaire (see Appendix E) to address the various information requirements of the study and focusing on elements that could not be answered through the participation analysis, or that would not be better addressed through the interviews. The questionnaire consisted of 29 core questions and focused on the extent to which FPs have leveraged areas of UK strength and helped introduce new areas of expertise, as well as profiling the benefits of UK participation
- In parallel, Technopolis analysed and prepared contact information relating to UK participants in FP6 and FP7. The questionnaire was uploaded to a professional online facility and every one of the 7,800+ UK FP6/7 participants identified was emailed with an invitation to contribute to the study. The team had to negotiate on 'surprise' when several university people replied letting us know that they were in a 'central support function' and were not themselves project participants, as listed in the FP7 database. As the survey was intended for direct participants, efforts were made to contact the relevant *participants* through offices of the listed central contacts, and as a result, we are aware that 26 individuals in central functions forwarded our request onto an additional 423 direct participants
- Taking undeliverable and 'opt out' messages together, and including the additional individuals contacted through central support function contacts, we can estimate that the pool of possible respondents numbered 6,732. A total of 1,208 respondents provided a usable questionnaire return, giving an overall response rate of 18%. The distribution of responses by organisation types was broadly in line with their overall share of FP6/7 participations. The survey responses provide a reliable sample from which to draw conclusions. The main findings from the participant survey are presented in Section 6 of the main report
- A programme of interviews with national stakeholders to deepen our understanding of the impacts of FP participation and the extent to which it has leveraged areas of UK strength, as well as provide a richer and more qualitative perspective than the one revealed through the survey or the desk research alone. The study identified an initial list of ~100 potential contacts, covering most programmes and areas of FP7 and most government departments and research councils. Based on this list, interviews were undertaken with 53 individuals. A full list of contributors is provided in Appendix G
- Interviews were semi-structured, based around the brief, but with sufficient flexibility within the interview process to allow interviewees to focus on those aspects where they could contribute best. The interview guide (shown in Appendix F) followed the same broad structure as the questionnaire survey, but allowed us to gain a more in-depth qualitative understanding of the main study questions. The findings are presented in Section 7
- Detailed analysis and reporting at two stages within the study. An interim report was produced, which detailed progress on all of the main work components and presented preliminary results from the participation analysis. Following completion of all data collection and analyses, a draft final report was then prepared and submitted. Based on a full analysis of all of the data and feedback presented, conclusions and recommendations have also been developed and are presented in Section 8

4. Desk research

4.1 Framework support for areas of UK strength

4.1.1 Introduction

This section of the report addresses the extent to which the EU RTD Framework Programmes have leveraged "areas of UK strength as identified from the UK R&D Scoreboard and BIS objectives, and by [comparison] with Technology Strategy Board and Research Council priorities."

The UK government provides very substantial and wide-ranging support for research, both through direct means (e.g. the science budget funding research in universities and colleges) and indirect (e.g. R&D tax credits to small businesses), broadly comprising three streams:

- The dual support system – institutional block grants (HEFCE QR) and 'project' funding (RC grants) – providing funds for basic and applied research carried out primarily in the higher education sector but also within selected national research institutes
- Government departments' R&D programmes and contracts, which fund research at full price to support policy or develop public services
- Public support for research and technology development within the private sector, through grants (e.g. the Technology Programme or Grant for R&D) and tax breaks (e.g. R&D tax credit)

This substantial undertaking becomes larger still when one takes into account the work of the non-governmental sector (NGOs) and in particular the research charities such as the Wellcome Trust or Cancer Research UK. With this panoply of research funders and funding streams, and for practical reasons therefore, we have been selective in our compilation of national research priorities, and have focused on the strategies of the public bodies with the largest research budgets:

- Department of Business, Innovation and Skills (BIS, previously BERR);
- The Technology Strategy Board; and
- The grant-awarding Research Councils.

4.1.2 Department of Business, Innovation and Skills (BIS)

In April 2009, BIS published a new industrial strategy to strengthen Britain's competitiveness in part by targeting public support on high-value economic sectors where fundamental technological change was expected to drive significant growth in global markets. The strategy identified six areas – or strategic sectors – with high growth potential and aligned with the UK research base:

- Advanced Manufacturing;
- Composites;
- Digital;
- Life Sciences and Medical Technologies;
- Low Carbon (encapsulating marine energy, renewable, nuclear, building technologies, etc); and
- Plastic Electronics.

4.1.3 The Technology Strategy Board

The mission of the Technology Strategy Board is to accelerate the development and application of technology – above and beyond that which the market might achieve on its own – in selected areas of adjudged strategic importance to the UK. Its strategy, 'Connect and Catalyse,' sets out sets of priorities, which inter-connect at many levels, key technologies, key applications and innovation platforms:

- Key Technology Areas:
  - Advanced materials
  - Bioscience
  - Electronics, photonics and electrical systems
  - High value-added manufacturing processes
  - Information and communication technologies
  - Nanotechnology
- Key application priorities to guide its activities:
  - Built environment
  - Creative industries
  - Energy generation and supply
  - Environmental sustainability
  - Healthcare
  - High-value services
  - Transport
- Innovation Platforms:
  - Assisted Living
  - Intelligent Transport Systems and Services
  - Low Carbon Vehicles
  - Low Impact Buildings
  - Network Security

4.1.4 Grant awarding research councils

The grant-awarding research councils' are pursuing a range of research priorities, comprising cross-council priorities on the one hand, such as energy, and single-council priorities on the other. Both types of priority are listed in the government publication, "The Allocations of the Science Budget: 2008/09 to 2010/11," which was published by the Department for Innovation Universities and Skills (BIS' predecessor department) in December 2007.

Figure 1 presents a consolidated list of research priorities, compiled from the 'Allocations' report, with the first row itemising the six, cross-council priorities, listed alphabetically. It should be noted that these priorities relate to strategic programmes, which complement the very substantial volume of research funding that is allocated through response-mode to sponsor the very best research no matter its subject. The financial split is nowhere specified, but is probably around 30:70, strategic: responsive.

Figure 1 – Research Council research priorities

Council	Priority
Cross-council	Ageing: Life-long Health and Wellbeing Digital economy Energy Global Threats to Security Living with environmental Change Nanoscience
AHRC	Global threats to security Innovation in the creative industries UK heritage industry
BBSRC	Ageing: Life-long Health and Wellbeing Bioenergy research Global Threats to Security Systems biology and predictive biology
EPSRC	Energy Digital economy Nanoscience
ESRC	Energy and environment Global poverty Global security Population change and migration Public health Succeeding in the global economy Understanding individual behaviour
MRC	Ageing: Life-long Health and Wellbeing Digital economy Living with environmental Change Replacement, refinement and reductions of animals in research
NERC	Earth observation science Energy Living with environmental Change

Source: compiled by Technopolis from "The Allocations of the Science Budget: 2008/09 to 2010/11," DIUS, December 2007.

4.1.5 Alignment with FP7 priorities

Having assembled a consolidated list of research priorities and themes for a selection of the biggest UK research funders, and FP7 programmes and priority areas, the next step was to seek to match the two lists. The matching was done manually using a simple keyword search of the CORDIS database, to look for instances of programmes or projects where the title or abstract matched with the subjects covered by each of the UK priorities identified.

This entailed a somewhat fuzzy process requiring cross-checks at multiple levels, using programme documents, online databases and calls for proposals (i.e., FP programme, priority, call and project). We searched within the collaborative research programmes and not the response-mode grants for European Research Council (ERC) awards or researcher mobility awards. It was beyond the scope of the current project to run a more exhaustive matching process, and nor did the team have an

opportunity to compare priorities in respect to their relative importance to a given research funder or programme (e.g. share of total spend, share of total number of awards or contracts).

Figure 2, Figure 3 and Figure 4 show the 'top-line' analysis, and suggest that the great majority of all of the UK's priority research areas can be linked to a specific FP7 collaborative research programme, priority action or call for proposals.

From this perspective, UK research priorities are a good match with those of the current Framework Programme, subject to the obvious caveat that any work originating in the UK will need to address a question the answers to which will have EU-wide relevance and not solely UK interest.

The analysis suggests that some UK research priorities are a better match with the Framework Programme than others, current UK interests in energy or nanoscience for example are a more direct and expansive fit with FP7 than is the digital economy or high-value services. Several UK priorities, such as advanced materials and creative industries, are more closely aligned with programmes in previous Framework Programmes, such as Brite-Euram or Media and Media plus.

There is a less good fit with the AHRC and ESRC work in areas like culture and heritage, poverty or migration, however this is arguably the result of the Framework Programme's historical emphasis on engineering and applied sciences (STEM subjects). There is also substantial additional funding for the arts, humanities and social sciences through the more classically response mode programmes of the ERC, Marie Curie, ESF and COST.

Figure 2 – Alignment of UK research council's priorities with FP7

Council	UK priority	Alignment	Comment
X-council	Ageing: Life-long Health and Wellbeing		Theme is being addressed indirectly through projects in each of the FP7 health research priorities and in the Social Science and Humanities area
X-council	Digital economy		This UK priority area is only really covered by the FP7 ICT theme where there is a specific ICT technology or application involved (so it's a better fit with EPSRC and MRC). Digital content, software, creative industries, etc, was a cluster of topics that was addressed more directly in earlier programmes, from FP4, 5 and 6.
X-council	Energy		Parallel programme in FP7
X-council	Global Threats to Security		Parallel programme in FP7
X-council	Living with environmental Change		Parallel programme in FP7
X-council	Nanoscience		Parallel programme in FP7
AHRC	Global threats to security		Parallel programme in FP7
AHRC	Innovation in the creative industries		Creative industries projects are still being financed through FP7, However these are few in number (3) and fall within the ICT programme. There was a creative industries programme of sorts, the Media programme, in FP4.
AHRC	UK heritage industry		Culture and heritage were previously picked up through the FP6 IST and energy / environment programmes, however there appears to be less opportunity in FP7 ICT and no projects funded so far in FP7 social science and humanities
EPSRC	Ageing: Life-long Health and Wellbeing Bioenergy research		Theme is being addressed indirectly through projects in each of the FP7 health research priorities and in the Social Science and Humanities area
EPSRC	Global Threats to Security		Parallel programme in FP7
EPSRC	Systems biology and predictive biology		Good fit with the third strand in the FP7 collaborative research programme, Food, Agriculture and Biotechnology. It is also a good fit with the first of three priority areas within the FP7 health programme, biotechnology for human health
EPSRC	Energy		Parallel programme in FP7
EPSRC	Digital economy		This UK priority area is only really covered by the FP7 ICT theme where there is a specific ICT technology or application involved. Digital content, software, creative industries, etc, was a cluster of topics that was addressed more directly in earlier programmes, from FP4, 5 and 6.
EPSRC	Nanoscience		Parallel programme in FP7

Council	UK priority	Alignment	Comment
ESRC	Energy and environment		Aligns with two parallel programmes in FP7
ESRC	Global poverty		One of several topics within one of seven priority areas within the social science and humanities theme of FP7, which is the smallest collaborative research programme with total budget of c EUR 600 million)
ESRC	Global security		Parallel programme in FP7
ESRC	Population change and migration		One of several topics within one of seven priority areas within the social science and humanities theme of FP7, which is the smallest collaborative research programme with total budget of c EUR 600 million)
ESRC	Public health		Addressed indirectly through calls for proposals dealing with delivery of healthcare and innovative treatments, within the health programme
ESRC	Succeeding in the global economy		No directly analogous programme
ESRC	Understanding individual behaviour		Some behavioural research projects have been supported in the FP7 energy, environment and ICT programmes
MRC	Ageing: Life-long Health and Wellbeing		Theme is being addressed indirectly through projects in each of the FP7 health research priorities and in the Social Science and Humanities area
MRC	Digital economy		This UK priority area is only really covered by the FP7 ICT theme where there is a specific ICT technology or application involved (so it's a better fit with EPSRC and MRC). Digital content, software, creative industries, etc, was a cluster of topics that was addressed more directly in earlier programmes, from FP4, 5 and 6.
MRC	Living with environmental Change		Parallel programme in FP7
MRC	Replacement, refinement and reductions of animals in research		Partly addressed through call for proposals on alternative testing strategies within the health programme
NERC	Earth observation science		Addressed within one of four priority areas of the environment programme (earth observation) and one of three priority areas of the FP7 space programme (GMES)
NERC	Energy		Parallel programme in FP7
NERC	Living with environmental Change		Parallel programme in FP7

Figure 3 – Alignment of BIS 'strategic sectors' with FP7

BIS 'strategic sectors'	Alignment	Comment
Advanced Manufacturing		Aligns well with the third of four priorities (new production technologies) within FP7 collaborative research theme 4 (NMP), and the fourth priority (integration of technologies for industrial application). There is support for manufacturing in the Ag, Food and Biotech theme too.
Composites		No specific programme or priority, although there is a materials strand to the NMP programme. However, advanced engineering / structural composites are picked up in several calls related to NMP and to the aeronautics aspects of FP7 transport.
Digital		Digital is covered by FP7 ICT in the sense of advanced electronics design / devices and robust systems, however software and creative industries are much less well covered than they have been in past FPs
Life Sciences and Medical Technologies		Aligns well with the FP7 health programme
Low Carbon		Low carbon is a recurrent theme within three FP7 programmes, energy, environment and transport
Plastic Electronics		FP7 ICT is supporting numerous projects and electronics in the broad area related to organic, flexible and plastic electronics

Figure 4 – Alignment of Technology Strategy Board priorities with FP7

TSB priorities	Alignment	Comment
Advanced materials		Key priority within the FP7 NMP programme
Bioscience		This is a priority area within the FP7 health programme
Electronics, photonics and electrical systems		Key priority within the FP7 ICT programme
High value-added manufacturing processes		Aligns well with the third of four priorities (new production technologies) within FP7 collaborative research theme 4 (NMP), and the fourth priority (integration of technologies for industrial application). There is support for manufacturing in the Ag, Food and Biotech theme too.
Information and communication technologies		Parallel programme in FP7
Nanotechnology		Priority area within the FP7 NMP programme
Built environment		This is a priority area within the FP7 environment programme
Creative industries		The creative industries are only covered by the FP insofar as the ICT programme will support novel developments in the design and engineering technologies
Energy generation and supply		FP7 energy programme addresses all aspects of renewables, clean coal, smart energy networks and energy efficiency
Environmental sustainability		This is a priority area within the FP7 environment programme
Healthcare		This is a priority area within the FP7 Health programme
High-value services		There has been substantial work on advanced telecommunications networks etc to support high value services, from cash machines to satellite navigation. However, there are very few projects concerned with the development of business models / products / process innovations of for example financial services or consulting engineers.
Transport		Parallel programme in FP7
Assisted Living		No directly equivalent programme or priority area. However, FP7 has issued calls for proposals with relevant topics in both its Health and ICT programmes
Intelligent Transport Systems and Services		Big focus is on clean / efficient power plants and safe vehicles, however the FP7 transport programme does include priority areas covering inter-modal transport systems and the construction of integrative transport systems
Low Carbon Vehicles		Addressed by three or four priority areas within the FP7 Transport programme
Low Impact Buildings		This is a priority area within the FP7 environment programme
Network Security		This is a priority area within the FP7 ICT programme and the FP& security programme

4.2 Key players and the FP

4.2.1 Introduction

This sub-section of the report presents the results of analyses to test the extent to which key UK research groups and businesses participate in the FP. This question is also addressed in two subsequent chapters, which are the results of the participant survey and the feedback from interviews with stakeholders. Here the analysis sought to match individual organisations identified in the FP6 participant data with named organisations listed in one or other of two UK performance indices, one for universities and one for businesses, which is the RAE2008 profiles and the BIS Industry R&D Scoreboard. The matching analyses did not include a review of research institutes, as there is no readily available scoreboard against which to make the necessary comparisons.

4.2.2 UK university participation in FP6

UK universities have been very active participants in successive EU RTD Framework Programmes, and analysis of participation data confirm this was still the case in FP6.

The totals are impressive with more than 100 discrete universities and colleges having been involved in almost 5,000 participations across the life of FP6. That is almost 70% of all UK HEIs and almost 20% of all FP6 HEI participations across all countries.

Figure 5 presents a breakdown of UK university participation by FP6 Priority Area, which shows significant levels of participation by the HE community in each of the seven collaborative research programmes. This holds for both numbers of participating institutions (individual HEIs) and numbers of participations.

Figure 5 – UK HEI participation in FP6, by Priority Area

FP6 Priority Area	No. HEIs	% all UK HEIs	Total no. of UK university participations	UK university share of all FP6 participations
1. Life sciences for health	59	36%	605	8.9%
2. Information society technologies	86	52%	860	6.0%
3. Nanotechnologies, etc	68	41%	327	5.6%
4. Aeronautics and space	40	24%	163	4.7%
5. Food quality and safety	52	32%	155	4.8%
6. Sustainable development	73	45%	475	4.5%
7. Citizens and governance	61	37%	230	11.8%

Source: Technopolis analysis of E-CORDA FP6 data

Column two shows the total number of individual UK universities and colleges that had participated in at least one project or action in the Priority Area in question. Column three places the raw count in context, expressing the number of participants as a share of the total number of UK universities and colleges, and ranging from around a quarter to just over one half of all HEIs.

Column four presents the number of *participations* by UK universities in each FP6 Priority Area, which shows greater variability across the seven areas than do the participant data, with the figures ranging from a low of around 160 for food quality and safety to a high of 860 for Information Society. The variation across the seven areas is the result of a combination of factors, of which the size and scope of the FP6 programme is the most significant. For example, the Information Society was by far the largest programme, encompassing research topics from embedded systems to e-government. By contrast, the aeronautics and space programme is smaller and more sharply focused on technology development relevant to aviation and environmental monitoring.

The importance of scope (rather than applicant quality) is confirmed by the much narrower spread in column five, where UK university participations as a share of all FP6 participations, for all types of organisation in all member states, is typically around 5%. The share reaches almost 12% for citizens and governance, however the differential is a function of much lower levels of industry participation in this priority area, as compared with the other areas.

4.2.3 Participation of leading academic research groups in FP6

In order to gauge the extent to which UK university participation in Framework involves the country's leading academic research groups, the study team needed to arrive at an objective measure of academic performance for all institutions in order to permit a matching exercise.

The RAE2008 results proved to be the most practicable basis for ranking universities, which involved the team in a two-step procedure to:

- Reconcile the 67 units of assessment (UoAs) from RAE2008 with each of the seven FP6 Priority Areas; and
- Establish an overall research quality score (and ranking) for each university within each FP6 Priority Area, before going on to match those data with FP6 participant data

The reconciliation process must be an approximation, by definition, as the RAE UoAs encompass both fundamental (e.g. biological sciences) *and* applied research (e.g. dentistry) fields, while the Framework Programme Priority Areas are concerned primarily with applied research that has an explicit socio-economic mission. Moreover, even those UoAs that deal with the applied sciences and engineering can pose problems as regards fit. For example, UOA 28 (mechanical, aeronautical and manufacturing engineering) is a self-evidently good candidate for linking with the FP6 Priority Area, Aeronautics and Space. However, it is also a good candidate for another Priority Area, in this case, the Nanotechnology, Materials and Production Processes (NMP). Lastly, we assigned the 30 plus RAE2008 UoAs covering the arts, humanities and social sciences to a single FP6 Priority Area, Citizens and Governance in a Knowledge-Based Society.

The RAE2008 results are published for all UK HEIs and all subjects, however they are not presented as either ranked lists or with a singular score that would permit ranking, and so the study team used its own methodology to compute a score and ranking for each university and subject area. A single score was assigned to each university within each U0A based on the percentage of its researchers that were rated as 4* and 3* (combined). Scores were then totalled for each university within the UoAs linked to each FP6 Priority Area. This provided a single 'quality' score for each university in each FP6 Priority Area, which then enabled us to rank the universities based on their quality profile.

A second set of ranked lists was generated based on the number of participations each university had within each FP6 Priority Area. Finally, we tested the level of correlation between the two ranked lists in order to determine the extent to which the profile of universities (based on their RAE performance) mirrored the profile of universities based on their level of involvement in FP6.

Figure 6 presents the summary table of correlation coefficients for each FP6 Priority Area, and shows very strong positive correlations for all areas (in principle, the values might fall anywhere between -1 and 1). This provides a strong indication that the UK's leading academic research groups within each thematic area were also the most active FP6 university participants.

Figure 6 – Correlation between UK university participations by FP6 Priority Area and RAE2008

FP6 Priority Area	No. of linked RAE UoAs	Correlation coefficient of overlap between RAE rankings and FP6 participation rankings
1. Life sciences, genomics and biotechnology for health	15	0.72
2. Information society technologies	3	0.81
3. NMP	1	0.43
4. Aeronautics and space	2	0.72
5. Food quality and safety	1	0.48
6. Sustainable development, global change and ecosystems	7	0.73
7. Citizens and governance in a knowledge-based society	35	0.67

Source: Technopolis analysis based on RAE2008 profiles and FP6 participation data

4.2.4 Leading research-active businesses and FP

In order to gauge the extent of participation in FP6 by leading research-active businesses, the team took the published statistics from the UK R&D Scoreboard for 2007 (2006 data), and then matched these institutions with FP participation data.

The R&D Scoreboard data list the top 850 companies disclosing R&E expenditure in the UK, across 39 sectors from Aerospace (sector number 1) to Travel and Leisure (sector number 39). This captures the great majority of all research active companies expending more than £0.5 million a year on R&D.

Comparing the 2007 R&D Scoreboard list with the FP6 participant database shows 134 of the 850 companies as having participated on at least one occasion in an FP6 project or action, with 525 participations between them. These 134 companies are spread across 24 of the 39 sectors, which comprise 746 of the 850 firms in the Scoreboard, so around 18% of the total for that sub-set of

research-performing sectors. The remaining 15 sectors (100 firms) in the R&D scoreboard registered no participations in the FP6.

The FP6 database shows a total of just over 1000 UK companies as participants in FP6, with a total of almost 1,700 participations. The difference between the total number of research active business in FP6 and as reported by the R&D Scoreboard is accounted for by smaller firms that spend less on R&D than the £0.5 million threshold for inclusion in the Scoreboard or consultancies that carry out contract research for third parties and so do not *spend* their own money on R&D. The latter is an important research-performing constituency in the UK, and elsewhere in Europe.

Figure 7 presents our analysis of Scoreboard participation in FP6 by sector, sorted in descending order by the number of companies in each sector involved in FP6.

Figure 7 – R&D Scoreboard companies by sector, sorted by number participating in FP6

Sector	No. in R&D scoreboard	No. participating in FP6	% participating in FP6	Main FP6 Priority Area in which these companies were active
33 Pharmaceuticals & biotechnology	114	20	18%	1. Life sciences
37 Technology hardware & equipment	61	15	25%	2. IST
5 Chemicals	60	15	25%	3. NMP
8 Electronic & electrical equipment	79	14	18%	2. IST
35 Software & computer services	125	11	9%	2. IST
1 Aerospace & defence	24	10	42%	4. Aeronautics and space
36 Support services	39	7	18%	6. Sustainable development
14 Gas, water & multi-utilities	10	5	50%	6. Sustainable development
20 Industrial engineering	45	5	11%	6. Sustainable development
7 Electricity	10	5	50%	6. Sustainable development
18 Health care equipment & services	40	4	10%	1. Life sciences
2 Automobiles & parts	23	3	13%	2. IST
23 Leisure goods	13	3	23%	2. IST
6 Construction & materials	15	3	20%	6. Sustainable development
30 Oil & gas producers	5	2	40%	6. Sustainable development
12 Food producers	24	2	8%	5. Food quality and safety
27 Mobile telecommunications	4	2	50%	2. IST
22 Industrial transportation	7	2	29%	6. Sustainable development
10 Fixed line telecommunications	5	1	20%	2. IST
31 Oil equipment, services & distribution	7	1	14%	3. NMP
16 General industrials	18	1	6%	4. Aeronautics and space
21 Industrial metals	5	1	20%	3. NMP
26 Mining	5	1	20%	3. NMP
32 Personal goods	8	1	13%	Human resources and mobility

Source: Industry R&D Scoreboard, 2007 (2006 data), DIUS

The Pharmaceuticals and Biotechnology sector comes out on top with 20 (of its 114) companies participating, reflecting in part the fact that this is the largest R&D-performing sector by far in the UK (with total spend of around £7.5 billion in 2006). This includes major pharmaceutical companies like AstraZeneca and Glaxo SmithKline as well as a long list of smaller biotechnology companies. The Technology Hardware sector is in second place, and while this is a much smaller research-performing sector by comparison with pharma (61 businesses and £0.86 billion), it

includes major electronic design and equipment manufacturers from ARM holdings to Xerox, and which address the largest Priority Area in FP6. There are no great surprises in the ranked list, perhaps with the exception of Aerospace at 6th place, however that is arguably a reflection of the much greater levels of industry concentration here and the narrower scope of opportunities within FP6. The importance of industry structure is confirmed by the results shown in column four, wherein there is a small group of sectors where around 10% of Scoreboard companies were present in FP6, such as software and healthcare, where good performance in respect to the number of participants is muted by the size of the population of smaller research performing businesses in those sectors. The opposite appears to hold too, with aerospace and utilities, amongst others, achieving 40-50% penetration (share of scoreboard companies in FP6). The final column in the table lists the FP6 Priority Area that accounts for most of a given sector's participations. This analysis confirms the differences in the scope of the FP6 Priority Areas, with two areas predominating, IST and sustainable development. Food quality and Aeronautics are narrower in scope and much more closely aligned with a single sector. The same holds for the life sciences priority area, which although very large, aligns very closely with the interests of two sectors, pharmaceuticals and biotechnology and healthcare equipment and services.

Figure 8 lists the top 10 firms from the R&D Scoreboard, based on their number of participations in FP6. The table is sorted by the number of participations, in descending order. It also includes the firm's rank in the R&D scoreboard composite index, where for example Glaxo SmithKline was ranked first (with annual R&D expenditure in the UK amounting to £3.4 billion in the financial year 2005/06) and AstraZeneca was second (£2 billion). In this analysis, we can see that the top 10 (scoreboard) firms in FP6 are at best a reasonable match for the Scoreboard top 10, with five of the Scoreboard top 10 appearing in the FP6 / Scoreboard top 10. Carrying on in that vein, the Scoreboard / FP6 top 10 includes 6 of the Scoreboard top 20, 7 of the top 50, 8 of the top 200 and 10 of the top 300. The inclusion of QinetiQ, Thales and NEC Europe in the list is arguably a reflection of these being very large research and technology organisations that have small in-house research programmes to complement their much larger contract research operations, for their corporate owner or for the market more generally.

Figure 8 – Top 10 R&D scoreboard companies participating in FP6, sorted by participations

Company	Participations in FP6	Rank in all companies' composite (850)
Rolls Royce Plc	38	8
BAe Systems Limited	31	3
Airbus UK	30	7
British Telecommunications Plc	29	4
QinetiQ Limited	26	177
BP International Limited	20	15
Johnson Matthey Fuel Cells Limited	18	47
Unilever UK Central Resources Limited	17	5
NEC Europe Ltd	17	284
Thales Research & Technology (UK) Limited	12	251

Source: Industry R&D Scoreboard, 2007 (2006 data), DIUS

Figure 9 presents an analysis of the correlations for each sector, wherein we have sought to compare the rankings of Scoreboard companies within their sector, using reported R&D expenditure with those same firms' rankings within FP6, based on the number of their participations.

The test permits us to explore the extent to which the bigger research spenders, within the sector, tend to participate more in FP. Intriguingly, we find strong correlations (>0.5) for nine of the 24 sectors, and while most of these sectors are highly concentrated (aerospace, oil and gas, utilities, etc.), that is not the case for all (construction and Leisure). There is a reasonable correlation for several of the country's medium technology industries (e.g. automotive, chemicals, technology hardware). However, there is a weak correlation for several major research performing sectors, most notably pharmaceuticals and biotechnology. This is a surprising finding on the face of it, and while the strength of the association is likely to be weakened by the size of the sector (114

companies), there is a very clear thematic link between this group of companies and FP6 support for life sciences for health.

Figure 9 – Correlation between the R&D Scoreboard ranking and FP6 ranking

Sector	Coefficient of overlap between rank in FP6 and R&D rank
Gas, water & multi-utilities	0.76
Aerospace & defence	0.71
Fixed line telecommunications	0.71
Industrial metals	0.71
Oil & gas producers	0.71
Construction & materials	0.68
Mobile telecommunications	0.67
Oil equipment, services & distribution	0.61
Leisure goods	0.55
Automobiles & parts	0.45
Food producers	0.44
Electricity	0.44
Electronic & electrical equipment	0.41
General industrials	0.40
Technology hardware & equipment	0.30
Industrial transportation	0.29
Chemicals	0.27
Personal goods	0.25
Software & computer services	0.19
Support services	0.10
Mining	0.10
Pharmaceuticals & biotechnology	0.10
Health care equipment & services	0.06
Industrial engineering	0.02

Source: Technopolis analysis of FP6 participant data and 2007 R&D scoreboard data

5. Analysis of UK participation in FP6 and FP7

5.1 Introduction

This section of the report provides a factual analysis of UK participation in successive Framework Programmes, with a particular emphasis on FP6 and FP7.

The analyses are wide-ranging, and cover UK participation in projects *and* in proposals. It should be noted, however, that because FP7 was still underway, as at January 2010, when the analyses were performed, the FP7 data were, of necessity, incomplete. Given the sequential nature of calls for proposals, the study had access to data on a larger proportion of what will ultimately be the final tally of proposals than it did for projects or participations.[1]

5.2 Trends in UK involvement over successive Framework Programmes

Below we provide a short analysis of how the UK's participation levels compare across successive Framework Programmes (FP5 to FP7). Limitations in data have meant that figures for FP4 are only available in relation to the numbers and share of projects with UK participation.

5.2.1 UK involvement in FP projects

Each EU RTD Framework Programme provides financial support to many thousands of projects, or 'actions' in FP-terminology, and such project statistics provide a useful perspective on the extent to which the research community within any given country or region is engaged with the programme.

Figure 10 shows the total numbers of FP4, FP5, FP6 and FP7 projects with UK involvement and compares these to the total number of projects supported under each Programme. The UK's project involvement rate (%) for each FP is shown, as are the changes over time in terms of the total numbers of FP projects supported and the number in which the UK has participated.

The data reveal that the UK has participated in a total of 20,652 projects across the 16-year period from the commencement of FP4 to (almost) the mid-point in the current programme, FP7 (to 1st November 2009). This means that at least one UK-resident organisation was involved in around 44% of all FP projects launched in the period (20,652 out of a total of just under 47,000 funded projects).

The total number of projects with UK partners has declined throughout the period, however the statistics suggest this is due to a structural change in FP projects rather than a changed performance by the UK research community. Compared with FP5, FP6 invested a substantially larger overall budget (+30%) in a very much smaller number (-38%) of what were on average very much larger projects. Time-series comparisons are complicated by the fact that successive programmes have had different budgets, different numbers of projects and different durations.

UK project involvement has fluctuated around its average of ~44.1%, varying from a low of 40.7% (for FP5) to a high of 47.1% (for FP4). Moreover, data from the first two calls of FP7 suggest the FP7 figures will be more in line with the performances seen in FP6 and FP4, rather than FP5.

These linked data suggest the UK's level of FP project involvement, as a share of all FP projects, has been broadly stable over time, which is a creditable performance with the substantial changes in programme size (budget), scope (subjects) and geography.

The EC budget for FP7, for example, was set for seven years rather than five, as had been the case in previous programmes. Equally, with a total EC budget of EUR 50.5 billion (plus the Euratom budget EUR 2.7 billion to 2011), FP7 saw a doubling of its annual spending power – from EUR 3.6

[1] In addition, while we provide an up-to-date picture of the numbers of proposals submitted to FP7, in the period to 1st November 2009, and the level of UK involvement in these, not all of the submitted proposals had been assessed. Moreover, not all of the successful proposals had concluded contract negotiations and been entered into the participation (contracts) database. As such, the calculated success rates contained in this report will understate the final rates, and so they have been used only to make comparisons within FP7 and not between FP7 and earlier FPs.

billion to EUR 7.2 billion – as compared with its predecessor, FP6. Investment has increased threefold since the launch of FP4. Geographical expansion has been even more dramatic, with the programme's scope having to extend from 15 EU member states to 27, across the period, as well as an equivalent increase in the numbers of associated members elsewhere in the world.

A comparison of the relative performance of the UK, France and Germany across successive FPs indicates that the UK has maintained a leading position in terms of the share of all FP projects in which it was involved, being ranked first (of these three countries) in FP5, FP6 and FP7.

Figure 10 – UK involvement in FP4, FP5, FP6 and FP7 projects

Indicator	FP4	FP5	FP6	FP7 (to date)	Total
Period	1994-1998	1998-2002	2002-2006	2007-2013	
Number of projects	15,457	16,251 (+5%)	10,058 (-38%)	5,105 (-49%)	**46,871**
Number of projects with UK partners	7,276	6,613 (-9%)	4,559 (-31%)	2,204 (-52%)	**20,652**
Share of projects with UK partners	47.1%	40.7%	45.3%	43.2%	**44.1%**
UK rank amongst all EU MS	-	1	1	1	-
Total EC Budget for period	ECU 13.2 bn	EUR 15 bn	EUR 19.1 bn	EUR 53.2 bn	

Sources: FP4 and FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

Overall, UK project involvement has ebbed and flowed somewhat across the last 16 years and the last four FPs, albeit fluctuating around a strong base. FP4 (47%) marked the high point and FP5 the nadir, with a recovery in FP6 that appears to be holding reasonably firm in FP7. The UK's relative performance has held up well across the period, consistently placing first amongst all EU member states on this particular metric. The number of projects has reduced across the period too, following a change in funding strategy by the Commission, moving from FP5 to FP6, and a decision to implement very much larger projects.

5.2.2 UK participations in FP projects

Figure 11 shows the total number of UK *participations* in FP5, FP6 and FP7 projects (data for FP4 are not available) and compares these to the total number of participations (all countries) under each Programme. The UK's share of all participations for each FP is shown, as are the changes over time in terms of the total numbers of FP participations and the number of UK participations.

The data reveal that the UK has had just less than 23,400 participations across FP5, 6 and 7 (to date) out of a total of just less than 185,000 participations (all countries), which compared with around 13,000 projects in the same period.

The number of UK participations declined by around 20% between FP5 and FP6, in absolute terms, and participations are 60% lower as we approach the halfway point for FP7. Close to half of that absolute decline is explained by structural change in the FP, as one moves from FP5 to FP6, with a smaller number of participations in FP6. The residual decrease might be explained in part through the accession of new member states.

As such, the UK's share of all FP participations has reduced marginally from a high of 13.6% (FP5) to around 12% for FP6 and FP7 to date.

A comparison of the relative performance of the UK, France and Germany across successive FPs indicates that the UK was ranked first in terms of the share of participations in FP5, but was overtaken by Germany in FP6 and is still ranked second behind Germany during the first part of FP7. However, the gap between the two countries appears to be closing.

Figure 11 – UK participation numbers in FP5, FP6 and FP7 projects

Indicator	FP5	FP6	FP7 (to date)	Total
Period	1998-2002	2002-2006	2007-2013	
Number of participations overall	80,068	74,400 (-7%)	30,518 (-59%)	**184,986**
Number of UK participations	10,905	8,792 (-19%)	3,679 (-58%)	**23,376**
UK share of all FP participations	13.6%	11.8%	12.1%	**12.6%**
UK rank amongst all EU MS	1	2	2	

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

5.2.3 FP funding realised by UK participants

Figure 12 shows the volumes of EU funding allocated to UK participants under FP5, FP6 and FP7 (to date) and compares these to the total funding allocations made (i.e. to all countries) under each Programme. The UK's share of the total for each FP is shown, as are the changes over time in terms of the total volume of FP funding allocated, overall and to UK participants.

The data reveal that UK participants have received just over €5.76 billion across FP5-7 (to date) out of a total of just over €38.7 billion (all countries), which is approaching EUR 500 million a year. This is a meaningful addition to national support for R&D, at around 10% of the science budget.[2]

The UK's share of FP funding has averaged 14.9%, but has ranged from a low of 14.2% (FP6) to a high of 15.9% (FP5). Based on current performance, the UK share of the FP7 budget is likely to end up between these two figures.

A comparison of the relative performance of the UK, France and Germany across successive FPs indicates that the UK was ranked second behind Germany in terms of the share of FP6 funding received, and remains so during the first part of FP7. However, as with participations, the gap between the two countries appears to be closing slightly.

Figure 12 – EU funding allocations to the UK under FP5, FP6 and FP7 (€ million)

Indicator	FP5	FP6	FP7 (to date)	Total
FP funding allocations, all countries	12,854	16,669 (+30%)	9,216 (-45%)	**38,739**
FP funding allocations, UK only	2,047	2,370 (+16%)	1,348 (-43%)	**5,765**
UK share of FP budget	15.9%	14.2%	14.6%	**14.9%**

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

5.3 The UK's level of FP funding in context

Further analyses of the UK's level of FP6 and FP7 funding were conducted and compared with that of other Member States in order to place the level of 'return' to each country in context. The shares of FP6 and FP7 funding (to date) have been compared with Member States' Gross Domestic Product (GDP), population, Gross Expenditure on Research and Development (GERD), and numbers of Full Time Equivalent (FTE) researchers[3].

[2] The Science Budget was around £6bn in 2009/10, which comprises, in the main, national funding for the UK's grant-awarding Research Councils and the Quality-Related funding for research provided to universities and colleges by the Higher Education Funding Council for England (HEFCE). This latter element relates to the funding of research at institutions in England only. The Science Budget does not include government funding for research expended through various ministerial or agency research programmes.

[3] Data for GDP, population, GERD and FTE researchers obtained from Eurostat

5.3.1 FP6 funding in context

UK organisations were allocated a total of €2,370 million in funding from FP6, out of a total allocation of €16.7 billion. UK organisations therefore received 14.2% of all FP6 funding. This level of FP6 funding was calculated to be:

- 20% higher than the UK's share of EU-25 population
- 8% higher than the UK's share of EU-25 FTE researchers
- 1% higher than the UK's share of EU-25 GERD
- 7% lower than the UK's share of EU-25 GDP

These results show that, depending on the metric used to place FP6 funding in context, the UK has performed either relatively well (e.g. in comparison with its population size) or relatively poorly (e.g. in comparison with its share of GDP).

Overall, however, the UK's financial return from FP6 can generally be regarded as good to reasonable on these measures. However, the UK's performance looks much less strong when ranked alongside the performance of other EU member states on each of these four metrics. Out of the EU-25, the UK was ranked:

- **9th** in terms of its ratio of FP6 funding to its share of EU-25 **population**
- **12th** in terms of its ratio of FP6 funding to **FTE researchers**
- **18th** in terms of its ratio of FP6 funding to **GDP**
- **20th** in terms of its ratio of FP6 funding to **GERD**

5.3.2 FP7 funding in context

The total budget for FP7 is €50.5 billion, covering the period 2007-13[4]. It is important to note that, because FP7 is ongoing, the data used for the analysis of FP7 participation to date includes just €9.2 billion of funding allocations, equivalent to 18.2% of the total budget for FP7 as a whole.

UK organisations have been allocated a total of €1,348 million in funding from FP7, out of a total allocation of €9,216 million. UK organisations have therefore received 14.6% of all FP7 funding. This level of FP7 funding was calculated to be:

- 33% higher than the UK's share of EU-27 population
- 26% higher than the UK's share of EU-25 FTE researchers
- 2% higher than the UK's share of EU-25 GERD
- 1% lower than the UK's share of EU-27 GDP

The UK's level of return from FP7 (to date) is higher than (25+% above) the level expected when compared with its share of population and FTE researchers, and roughly equivalent to the level expected when compared to its share of EU GERD and GDP.

In addition, on all four of the measures presented above the UK's relative rate of return is higher for FP7 than it was for FP6. This finding is confirmed to some extent by analysis that shows the UK has improved it's ranking on two of the four metrics, researchers and GDP, and ranked in the following positions out of the EU-27:

- **9th** in terms of its ratio of FP6 funding to **population**
- **10th** in terms of its ratio of FP7 funding to **FTE researchers**
- **13th** in terms of its ratio of FP7 funding to **GDP**

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[4] Amended proposal for a Decision of the European Parliament and of the Council, concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007-13), COM(2005) 119 final/2

- **20th** in terms of its ratio of FP7 funding to **GERD**

In comparison with other member states the UK's performance has improved (or remained the same) from FP6 to FP7 on each of the four 'benchmarks' described above (GDP, GERD, FTE researchers and population) and the UK stands above its main comparator countries (France and Germany) on each of the measures in FP7 to date.

The one benchmark area where the UK has achieved a lower than expected share of funding in both FP6 and FP7 (to date) is in comparison with its share of GDP. The Member States contribute to the EU budget in proportion to their share of EU GDP, so the findings above suggest that the UK's funding returns from both FP6 and FP7 (to date) are below the level of its input. This balance is similar for each of the other large EU member states, and especially Germany. However, this 'deficit' does appear to have reduced from FP6 to FP7, with the UK share of funding improving from 7% below expected levels (equivalent to a ~€177 million notional deficit) to 1% below expected levels (currently equivalent to a ~€14 million notional deficit).

5.4 Participation in FP6/7 by type of organisation

5.4.1 FP6 participations by organisation type

Figure 13 presents the breakdown of UK participations by the Commission's four main classes or organisation (or activity) type and provides a comparison with the breakdown for all FP6 participations. It should be noted that the figures are known not to be 100% accurate due to variability in the categorisation of organisations, wherein the same organisation is often allocated to several different categories across their various participations. In addition, the organisation type is not specified for ~1,000 participations (including ~80 in the UK).

These limitations notwithstanding, the data show that the UK's participation profile differs in important respects from that of FP6 as a whole. HEIs from the UK account for significantly more of the UK total (56%) than the FP6 average (36%), while UK research institutes account for significantly less (15% versus 28%). This is not a surprise given the structure of public sector research in the UK, with expenditure more concentrated in HEIs than in research institutes, as compared to many other EU countries.

Perhaps surprisingly, given the widespread expressed concerns about the level of business engagement, UK industry's share of participations is in line with the FP6 average, at around 20% of all participations. On this measure, share of participations, all member states' business communities have limited engagement, where industry participations lag public sector participations by around 3:1. UK participations by 'other' organisations is relatively low, at around 10%, where the average for the FP overall is 17%.

Figure 13 – Breakdown of UK FP6 participations and all FP6 participations, by type of organisation

Organisation Type	Number (and share) of participations – UK	Number (and share) of participations – FP6 overall
Higher Education	4,871 (56%)	26,490 (36%)
Industry	1,618 (19%)	13,908 (19%)
Research Institutes	1,272 (15%)	20,621 (28%)
Other	953 (11%)	12, 371 (17%)
Total[5]	**8,714 (100%)**	**73,390 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

5.4.2 FP6 funding by organisation type

The average volume of FP6 funding allocated to UK organisations *per participation* was €269.5k. This is roughly 20% higher than the average for FP6 as a whole (€224k), which explains why the UK's share of FP6 funding (14.2%) was higher than its share of participations (11.8%). Some

[5] The activity type of 78 UK participations and 1,010 participations overall in FP6 are unknown and have therefore been excluded from the table

significant variations were identified at the level of the four main types of participating organisations, as follows:

- UK HEIs were allocated a total of €1,410 million in funding. This represented 60% of all FP6 funding to UK organisations, a significantly larger share than that obtained by HEIs across FP6 as a whole (37%) and slightly above the share that might be expected given the level of UK HEI participation (56% of the UK total). UK HEIs received an average of €289k in funding per participation, 25% above the FP6 HEI average of €232k. Because UK HEIs had a very large number of FP6 participations and also a relatively high level of funding per participation, they are far more dominant within the national participant mix than is the case for other countries
- UK industry received €316 million in funding. This represented 13% of the UK's total, much lower than the share of funding obtained by industry across FP6 as a whole (18%) and below the share that might be expected given the level of UK industry participation (19%). The average amount of funding provided to UK industry per participation was €195k, 10% below the overall FP6 industry average of €218k. This goes some way to explaining why industry's overall share of UK FP6 funding is relatively low, and indicates that UK companies occupied a more minor role in the projects than did EU businesses on average, based on this measure at least
- UK research institutes were allocated €448 million in funding. This represented 19% of the UK's total, well below the overall share obtained by research institutes across FP6 as a whole (32%), but above the share that might be expected given the level of UK research institute participation (15%). Also, the average amount of funding per UK research institute participation was €352k, significantly above the overall FP6 research institute average (€253k), so it would appear that UK research institutes on average punch well above their weight and have occupied a major role in their FP6 projects (although their share of UK participations is low compared with other countries)
- Other UK participants were allocated €187 million in funding. This represented 8% of the UK's total funding from FP6, significantly lower than the share received by 'other' organisations across FP6 as a whole (13%) and below the share that might be expected given the level of 'other' UK participation (11%). However, the average amount of funding per participation was €196k, 14% above the FP6 average of €172k per participation by 'other' organisations

5.4.3 FP7 participations by organisation type

The standard classification of participants in FP7 by organisation (or 'activity') type contains five main categories. Figure 14 presents the breakdown of UK participations by organisation type and provides a comparison with the breakdown for all FP7 participations.

Again, the data show that the UK's participation profile differs in important respects from that of FP7 as a whole. Education establishments from the UK account for significantly more of the UK total (61%) than the FP7 average (39%), while UK research organisations account for significantly less (11% versus 26%). As in FP6, this reflects the structure of public sector research in the UK, with expenditure more concentrated in HEIs than in research institutes. The share of participations accounted for by UK commercial organisations, public bodies and 'others' is each slightly below the FP7 average. The increases in shares by participant type appear to be broadly in line with one another – UK and EU – and suggest that this movement is explained by a more complete allocation of organisations to each of the four main categories: the other category has reduced dramatically in both cases between FP6 and FP7.

Figure 14 – Breakdown of UK FP7 participations and all FP7 participations, by type of organisation

Organisation Type	**Number (and share) of participations - UK**	**Number (and share) of participations – FP7 overall**
Higher or secondary education establishments	2,238 (61%)	11,752 (39%)
Private commercial organisations	826 (22%)	8,072 (26%)
Public bodies (excl. research and education)	141 (4%)	1,983 (6%)
Research organisations	414 (11%)	7,883 (26%)
Others	60 (2%)	828 (3%)
Total	**3,679 (100%)**	**30,518 (100%)**

Source: FP7 participation data (E-CORDA, 1st November 2009)

5.4.4 FP7 funding by organisation type

The average volume of FP7 funding allocated to each participant has been €1.553 million, 67% more than the average for participants across the whole of FP7 (€931k). The average volume of funding allocated to UK organisations *per participation* has been €366k, more than 20% above the average for FP7 as a whole (€302k). Some significant variations were identified at the level of the five main types of participating organisations, as follows:

- UK HEIs have been allocated a total of €889 million in funding. This represents 66% of all FP7 funding to UK organisations, a significantly larger share than that obtained by HEIs across FP7 as a whole (42%) and slightly larger than the share that might be expected given the level of UK HEI participation (61%). UK HEIs received an average of €397k per participation, 21% above the FP7 HEI average (€327k). UK HEIs have therefore had a very large number of participations in FP7 and a relatively high level of funding per participation, and around EUR 100K more than the average for FP6. These factors combine to make UK HEIs far more dominant within the national participant mix than is the case for other countries
- UK private commercial organisations (industry) have received €269 million in funding. This represents 20% of UK's total, slightly lower than the share of funding obtained by private commercial organisations across FP7 as a whole (24%) and also below the share that might be expected given the level of UK industry participation (22% of the UK total). However, the average amount of funding provided to UK industry per participation has been €326k, 20% above the overall FP7 industry average (€271k), so it would appear that UK industry participants have occupied a major role in their FP7 projects (although their share of UK participations is low compared with other countries)
- UK public bodies have been allocated €40 million in funding. This represents 3% of UK's total, which is the same as the overall share obtained by public bodies in FP7 as a whole and only slightly below the share that might be expected given the level of UK public body participation (4%). The average amount of funding per UK public body participation has been €245k, significantly above the overall FP7 public body average (€157k)
- UK research organisations were allocated €138 million in funding. This represents 10% of the UK's total, well below the overall share obtained by research organisations across FP7 as a whole (29%), but in line with the share that might be expected given the level of UK research organisation participation (11%). The average amount of funding per UK research organisation participation was €334k, slightly below the overall FP7 research organisation average (€341k)
- Other UK participants were allocated €12 million in funding. This represented only 1% of the UK's total funding from FP7, significantly lower than the share received by 'other' organisations across FP7 as a whole (2%), but in line with the share that might be expected given levels of participation. The average amount of funding per participation was €200k, 9% below the FP7 average of €220k per participation realised by 'other' organisations across FP7 as a whole.

5.5 Participation in FP6/7 by Thematic Priority Area

5.5.1 UK participation within FP6 Thematic Areas

FP6 was made up of three main blocks of activities,[6] which were further subdivided into 17 areas. Block 1 – focusing and integrating European research – was dominated by seven Priority Thematic Areas, which accounted for around two-thirds of total expenditure in FP6.

Figure 15 lists the 17 areas, including Euratom, and, for each area, presents a series of standard metrics: the number of UK projects and participations, and the volume of EC funding allocated to UK participations within each. On this analysis, in volume terms, the **Life sciences, genomics and biotechnology**, **Information society technologies**, **Sustainable development** and **Human resources and mobility** areas were the most significant, with over 380 projects, over

[6] 1. Integrating and Strengthening the European Research Area; 2. Structuring the European Research Area; 3. Nuclear Research (Euratom)

900 participations and in excess of €240 million in funding achieved by UK in each. The table reveals an obvious skewedness in volume terms, across the overall portfolio, and within the individual blocks. However, this unevenness is evident in the overall Commission budget for FP6, and so it is this programme-level structure that is the primary explanation as to why the UK registered 1,500 participations in IST and 100 in science in society.

Putting aside any bigger question about the correctness of the sizing of one area as compared with another, to adjust for these differences at the FP-level, Figure 15 also shows the *share* of all FP6 projects, participations and EC funding accounted for by UK participation for each Priority Area.

Lastly, arrows (↑↓↔) have been assigned to indicate a judgement as to whether the UK has performed better or worse in a given area, as compared with its performance overall in FP6, for each performance ratio (i.e. share of projects, share of participations, share of funding). This simple rating system is used at several points through the report, so it is perhaps worth explaining how it works. Across FP6 as a whole, the UK accounted for 11.8% of all participations, so looking to the individual Priority Thematic Areas for example, a participation rate of 12.1% in the Aeronautics area is broadly in line with the participation rate overall, which has been tagged with an 'average' symbol (↔). By contrast, the 13.4% of life sciences' participations is 'above' the average for FP6 participations overall (↑) and at 10.5%, the share of participations for the IST area is below average (↓). The equivalent performance yardsticks for UK share of projects and EC funding are also shown in the final row, and are 45% and 14% respectively.

The results indicate that UK has performed above average in terms of its project share in most areas, with at least one UK-resident organisation taking part in over half (58%+) of the projects in 12 of the 17 priority areas. This suggests the UK was engaged very widely in FP activities, across the entire portfolio. The Human Resources and Mobility area is the one exception that stands out, as it is a sufficiently large component of the FP to influence the UK's overall performance, and perhaps most important, support for research training and mobility is one of the FP's central pillars.

The share of participations and funding tend to be more widely regarded as performance indicators, in comparison with share of projects involving UK organisations. The latter does not capture the intensity of engagement, and importantly it is susceptible to differences in the rules governing projects in particular areas. For example, the European Research Council and Marie Curie actions have a much simpler structure than the much more extensive collaborative projects favoured in the thematic priority areas. In practice, this means that a significant share of all member states might be represented in a large thematic project, where there are structural limits within Marie Curie actions that would make it impossible for any member state to be represented in more than a minority of all projects.

On these two metrics, participations and funding, performance is more variable across the portfolio. On participations, four areas are above average and eight below. Interestingly, the mobility area recorded a very much stronger than average performance, and given its size, this tends to masks mediocre to poor performance in other key areas from aeronautics to ICT. The spread is more polarised still on funding, with six areas above average and nine below.

On these two measures, the results indicate that the UK has performed strongly in the **Life sciences**, **Policy support**, **Horizontal research activities (SMEs)**, and **Human resources and mobility** Priority Areas. The UK has also performed well in terms of funding (though not participations) in the **Food quality and safety** and **Research infrastructure** areas.

On these measures, the areas of weakest performance are the **Support for international cooperation**, **Research and innovation**, **Support for the coordination of activities** and **Development of research and innovation policies**.

A comparison between funding per UK participation in each of the 17 Priority Areas and the level of funding per participation for others in the same / all projects suggests that in most of the Priority Areas UK participants are receiving a higher funding amount on average than their partners in the same projects and than participants in all projects. Overall, UK participants received 15% more funding on average than their partners in the same projects, and 20% more than the average for all participants in all projects.

5.5.2 UK participation within FP7 Thematic Areas

FP7 is made up of five specific programmes[7], which are further subdivided into 22 Thematic Priority Areas. Figure 16 lists the 22 Priority Areas and shows the number of UK projects and participations, and the volume of EC funding allocated to UK participations within each. It indicates that in terms of numbers alone the **Health** and **Information and communication technologies (ICT)** areas are the most significant to date, with over 230 projects, over 470 participations and in excess of €208 million in funding achieved by the UK in each. There has also been a large number of **Marie Curie Action** projects (586) and participations (687), although UK funding in this area (€155 million) is slightly lower than the two Priority Areas highlighted above.

Figure 16 also shows the *share* of all FP7 projects, participations and EC funding accounted for by UK participation in each Priority Area. Arrows (↑↓↔) have again been used to symbolise whether the UK has performed more or less well in each area, as compared with its overall performance.

The results indicate that UK has performed above average in terms of its project share in most cases, achieving an involvement rate of between 50% and 80% in 16 of the 22 Priority Areas. In particular, the UK has been involved in at least three-quarters of all FP7 projects in the areas of **Fusion Energy**, **Socio-economic sciences and humanities** and **Research for the benefit of SMEs**.

On participations and funding, the UK has performed strongly in **Health**, **Socio-economic sciences and humanities**, **Marie Curie actions** and the **European Research Council**. It has also performed very strongly, in terms of funding, in **Research infrastructures** and **Fusion energy** areas. Indeed, four of these six areas, ERC, Health, Marie Curie and Research Infrastructures, account for more than half of all UK income from across the 22 areas of FP7.

The areas of weakest performance on these measures are the **Activities of international cooperation**, **Coherent development of research policies**, **Regions of knowledge**, **General activities** and **Research potential** areas. In the subject-based areas, the UK's share of participations and funding is lowest in **Energy**, **Space** and **Nanoscience**. **NMP** and **ICT** are probably the two most significant areas of 'poor performance,' given the size of the total FP budgets allocated to these areas.

[7] 1. Cooperation; 2. Ideas; 3. People; 4. Capacities; 5. Nuclear Research

Figure 15 – UK FP6 projects, participations and EC funding, by Priority Area

Priority	Projects	Participations	EC funding (€ million)	Project share	Participation share	EC funding Share
1. Life sciences, genomics and biotechnology	388	916	377.62	65%↑	13.4%↑	16.3%↑
2. Information society technologies	667	1,500	445.35	61%↑	10.5%↓	11.7%↓
3. Nanotechnologies and nanoscience	269	603	175.60	60%↑	10.3%↓	11.4%↓
4. Aeronautics and space	166	424	150.04	69%↑	12.1%↔	14.0%↔
5. Food quality and safety	121	369	117.52	65%↑	11.5%↔	15.6%↑
6. Sustainable development	387	998	241.54	58%↑	9.5%↓	10.5%↓
7. Citizens and governance	115	246	35.03	79%↑	12.6%↔	14.4%↔
Policy support / emerging Science &Technology (NEST)	338	598	96.52	65%↑	13.0%↑	16.0%↑
Horizontal research activities – SMEs	296	765	83.41	60%↑	14.1%↑	17.6%↑
Support for international cooperation	103	146	28.46	30%↓	5.8%↓	8.1%↓
Research and innovation	88	130	19.52	37%↓	7.1%↓	8.6%↓
Human resources and mobility	1,335	1,573	389.24	29%↓	18.6%↑	22.7%↑
Research infrastructures	89	185	161.98	58%↑	10.0%↓	22.6%↑
Science and society	73	106	8.41	45%↔	10.3%↓	10.8%↓
Support for the coordination of activities	60	85	20.17	59%↑	7.1%↓	7.0%↓
Development of Research & Innovation policies	9	10	1.05	47%↑	5.9%↓	7.6%↓
Euratom	55	138	18.17	71%↑	11.6%↔	9.8%↓
Total	**4,559**	**8,792**	**2,369.64**	**45.3%**	**11.8%**	**14.2%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

Figure 16 – UK FP7 projects, participations and EC funding, by Priority Area

Priority	Projects	Participations	EC funding (€ million)	Project share	Participation share	EC funding Share
Energy	54	107	28.5	51%↑	10%↓	9%↓
Environment (including Climate Change)	97	213	52.1	70%↑	12%↔	13%↓
Food, Agriculture, and Biotechnology	86	157	51.6	70%↑	10%↓	13%↓
General Activities (Annex IV)	3	3	0.7	21%↓	4%↓	1%↓
Health	238	474	208.1	73%↑	14%↑	17%↑
Information and Communication Technologies	348	582	239.5	59%↑	10%↓	12%↓
Nanoscience, Nanotechnologies, Materials and new PT	120	249	76.3	63%↑	10%↓	10%↓
Security	27	51	18.5	59%↑	9%↓	11%↓
Socio-economic sciences and Humanities	80	119	25.6	80%↑	14%↑	19%↑
Space	12	37	15.4	57%↑	9%↓	8%↓
Transport (including Aeronautics)	117	250	82.3	64%↑	10%↓	12%↓
Activities of International Cooperation	6	6	1.0	19%↓	2%↓	3%↓
Coherent development of research policies	3	4	0.5	27%↓	7%↓	4%↓
Regions of Knowledge	5	5	0.4	15%↓	2%↓	2%↓
Research for the benefit of SMEs	103	213	25.6	59%↑	13%↔	12%↓
Research Infrastructures	107	252	147.8	78%↑	12%↔	22%↑
Research Potential	3	3	0.1	4%↓	2%↓	0%↓
Science in Society	49	74	8.4	69%↑	14%↑	16%↔
Marie-Curie Actions	586	687	155.3	29%↓	18%↑	22%↑
European Research Council	134	140	198.9	21%↓	20%↑	20%↑
Fusion Energy	3	8	1.1	100%↑	13%↔	22%↑
Nuclear Fission and Radiation Protection	23	45	10.7	72%↑	10%↓	12%↓
Total	**2,204**	**3,679**	**1,348.3**	**43%**	**12.1%**	**14.6%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

5.6 FP6/7 participation by Type of Instrument

5.6.1 UK participation within FP6 Instruments

FP6 employed 10 types of instrument (from projects to networks to coordination actions) to deliver the programme, deploying a specific instrument, or combination of instruments, depending upon the thematic or priority area in question.

Figure 17 shows the numbers of projects and participations in which the UK was involved, and the volume of EC funding achieved for each of these main types of instrument. As with the Thematic and Priority Areas, the various instruments were used to a greater or lesser degree across FP6 and so it is not possible to draw firm conclusions on the performance of the UK from this information. However, in terms of numbers alone, UK participation was highest for Specific Targeted Research Projects (STREPs), Integrated Projects and Marie Curie Actions, with over 580 projects, over 1500 participations and in excess of €380 million in funding achieved by the UK for each instrument.

Figure 17 also shows UK projects, participations and EC funding expressed as a share of the FP6 totals for each type of Instrument. The results suggest that the UK has performed comparatively strongly in terms of its share of projects for most types of instruments. It was involved in almost all of the Networks of Excellence and Integrated Projects, which were typically very large actions involving partners from many countries, and between half and three-quarters of all funded projects for most of the remaining instruments.

The UK's share of the participations and funding associated with each type of instrument is a better performance indicator, and here there is more variability. The main areas of strong performance were Marie Curie Actions and Co-operative research projects, as well as Networks of Excellence (in terms of participations), and Integrated Infrastructure Initiatives (I3s) and Collective research projects (in terms of funding share). The UK's relative involvement in Specific Support Actions was low across all indicators (share of projects, participations and funding).

With the I3s, the UK's disproportionately large, high-calibre public-sector research base has been able to take advantage of the excellence-based competitions used to determine who gets access to the FP-financed additional capacity at leading national facilities across the other EU member states. The support actions, as their name suggests, have a service focus, and tend to be more relevant to technology centres and consultancies, which is a comparatively smaller constituency in the overall UK 'community.'

5.6.2 UK participation within FP7 Instruments

FP7 employed 11 types of instruments, several of which were new while others were substantially overhauled, as compared with the arrangements in FP6. Figure 18 shows the various instruments were used to a greater or lesser degree across the first calls for FP7 and so it is not possible to draw firm conclusions on the performance of the UK from this information. However, in terms of numbers alone UK participation has been highest for Collaborative projects, followed by Support for training and career development of researchers. For both of these types of instrument, the UK has achieved at least 585 projects, 685 participations and €155 million in funding.

Figure 17 also shows UK projects, participations and EC funding expressed as a share of the FP7 totals for each type of Instrument. The results are mixed and the UK does not have comparatively strong performance across all three indicators for any of the instruments. However, the UK has performed well in Combination of CP and SSA instruments (in terms of share of projects and funding), Support for training and career development of researchers and Support for frontier research (in terms of share of participation and funding), and Networks of excellence (in terms of share of projects and participations). The UK has performed comparatively less well in terms of its share of projects, participations and funding in Coordination and support actions.

Taken together, FP6 and FP7, these results reveal a reasonably consistent UK funding share across the different thematic and priority areas, with the I3s and SSAs / CSAs as the two outliers, high and low, respectively. This suggests the choice of instrument in general has relatively little impact on the attractiveness of the FP to UK organisations.

Figure 17 – UK FP6 projects, participations and EC funding (and share of FP6 totals), by Type of Instrument

Instrument	Projects	Participations	EC funding (€m)	Project share	Participation share	EC funding share
Networks of Excellence (NoEs)	168	675	184.6	98%↑	13.1%↑	14.6%↔
Integrated Projects (IPs)	585	2,033	875.8	83%↑	11.5%↔	13.2%↔
Specific Targeted Research Projects (STREPs)	1,357	2,330	553.2	60%↑	10.9%↔	12.4%↓
Coordination Actions (CAs)	349	706	68.9	72%↑	9.9%↓	11.3%↓
Specific Support Actions (SSAs)	423	596	82.90	31%↓	7.2%↓	8.7%↓
Co-operative Research Projects (CRAFT)	237	578	57.7	61%↑	15.7%↑	18.0%↑
Collective Research Projects (CLR)	56	186	25.6	66%↑	11.0%↔	17.3%↑
Integrated Infrastructure Initiatives (I3)	8	25	95.7	73%↑	7.4%↓	48.2%↑
Specific Actions to Promote Research Infrastructures (II)	45	95	36.6	54%↑	10.3%↓	10.6%↓
Marie Curie Actions (MCAs)	1,331	1,568	388.7	30%↓	19.2%↑	22.8%↑
Total	**4,559**	**8,792**	**2,369.6**	**45%**	**11.8%**	**14.2%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

Figure 18 – UK FP7 projects, participations and EC funding (and share of FP7 totals), by Type of Instrument

Instrument	Projects	Participations	EC funding (€m)	Project share	Participation share	EC funding share
Research for the Benefit of Specific Groups	101	216	26.5	58%↑	13.5%↑	12.9%↓
Collaborative Project	1,012	1,975	757.1	67%↑	11.6%↔	12.8%↓
Coordination and Support Action	273	415	54.8	36%↓	7.1%↓	7.4%↓
Combination of CP & CSA	81	202	140.5	82%↑	12.2%↔	22.8%↑
Support for Frontier Research (ERC)	133	139	198.7	20%↓	19.9%↑	20.5%↑
Support for training & career development of Researchers	585	685	155.2	31%↓	21.1%↑	22.7%↑
Network of Excellence	19	47	15.4	90%↑	11.5%↔	15.5%↔
Article 169 of the Treaty	-	-	-	-	-	-
Article 171 of the Treaty	-	-	-	-	-	-
Pilot Type B	-	-	-	-	-	-
Risk-Sharing Finance Facility	-	-	-	-	-	-
Total	**2,204**	**3,679**	**1,348.3**	**43%**	**12.1%**	**14.6%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

5.7 Role of UK participants within FP projects

5.7.1 Overview of UK coordination of FP projects

Participants in the Framework Programmes can occupy the role of project coordinator or are otherwise listed simply as one of the participants. Figure 19 shows the total number of projects (overall and with UK involvement) and the share of these projects with UK coordinators, for FP4, FP5, FP6 and FP7. It shows that the share of *all* projects with a UK coordinator fell from 23.1% (FP4) to 17.9% (FP5) and then to 17.3% (FP6), but has since risen again slightly to 18.0% (FP7 to date). The proportion of *UK* projects (i.e. those with UK involvement) with a UK coordinator fell from 49.0% (FP4) to (44.1%) and then to (38.1%), but has since risen again to 41.6% (FP7 to date).

Figure 19 – UK's participation in FP4, FP5, FP6 and FP7 (to date)

Indicator	**FP4**	**FP5**	**FP6**[8]	**FP7**
All projects	15,457	16,251	10,058	5,105
Projects with UK partners	7,276	6,613	4,559	2,204
Projects with UK coordinators	3,566	2,917	1,736	917
Share of all projects with a UK coordinator	23.1%	17.9%	17.3%	18.0%
Share of UK projects with a UK coordinator	49.0%	44.1%	38.1%	41.6%

Source: 'The Impact of the EU Framework Programmes in the UK' (Technopolis, July 2004); E-CORDA, (1st November 2009)

5.7.2 UK coordination of FP6 projects

In FP6, a UK partner occupied the role of project coordinator in 1,736 cases, or 38% of the projects in which UK participants were involved. This means that the UK participants were in a coordinating role for 20% of all UK FP6 participations, substantially above the FP6 average of 14%.

Analysis of UK coordination rates in different FP6 priority areas revealed that the UK had higher than average coordination rates in the majority of thematic or priority areas, particularly in the **Support for international cooperation** and **Development of R&I policies** areas, where UK coordinator to participation ratios (24% and 20% respectively) were nearly double the overall FP6 rates (14% and 11% respectively). This is noteworthy in that UK participations and income were very much lower in these two areas, compared with the UK average for all areas: UK organisations have been prominent in those leading roles while having much less involvement in the areas generally.

There were no areas of (relatively) low UK coordinator ratios, however in most of the thematic or priority areas in Block 1 of the programme UK coordination rates were similar to the FP6 pattern overall.

The likelihood of being a project coordinator varies significantly depending on the type of instrument in which organisations are involved. For example, the NoEs have an average of 30 partners and it is therefore relatively difficult to occupy a high share of coordinator roles within this type of instrument. However, Marie Curie actions have an average of only two partners, so we would expect to identify a high share of coordinator roles for this instrument. Analysis of the ratio of UK coordinators to participants for each type of instrument indicate that UK partners have occupied the role of coordinator to a higher degree than the overall FP6 average for most types of instrument, particularly Collective research projects and Integrated infrastructure initiatives (where coordinator ratios for the UK are around double the FP6 rates).

Analysis of the organisation (activity) type of the UK coordinators revealed that HEIs and research institutes were (relatively) most likely to fulfil the role of coordinator, occupying the position of coordinator in 33% and 29% of participations respectively. Industry participants were coordinators in 7% of their participations, while for 'other' organisations the figure was 12%.

[8] FP6 data is from FP6 database E-CORDA, December 2009

5.7.3 UK coordination of FP7 projects

In FP7 the UK partner has occupied the role of project coordinator in 917 cases, or 42% of the projects in which UK participants have been involved. This means that UK participants have been in a coordinating role for 25% of all UK FP7 participations, well above the FP7 average of 17%.

Patterns of UK coordination by FP7 Priority Area reveal higher than average coordination rates for the UK in many of the Priority Areas, particularly in the **Food, agriculture and biotechnology**, **General activities**, **Socio-economic sciences and humanities**, and **Fusion energy** Areas, where UK coordinator to participation ratios were approximately double the overall FP7 rate in each case. European enlargement has tended to increase participants and participations overall, and helped to drive up the coordination-participation ratios for the UK and several of the EU's other leading research countries.

Areas of relatively low UK coordinator ratios in comparison with overall FP7 figures were **Energy**, **Information and communication technologies**, and **Space**. In addition, there have been no UK coordinators so far in three of the Priority areas (Coherent development of research policies, Regions of knowledge, and Research potential Areas).

Coordination ratios by types of instrument indicate that UK partners have occupied the role of coordinator to a higher degree than the overall FP7 average for most instruments where the UK has so far participated, particularly Networks of excellence where the UK coordinator ratio is nearly double the overall FP7 rate.

Analysis of the organisation (activity) type of UK FP7 coordinators revealed that HEIs and research institutes were (relatively) most likely to fulfil the role of coordinator, occupying the position of coordinator in 44% and 34% of participations respectively. Industry participants were coordinators in 7% of their participations, public bodies were coordinators in 18%, and for 'other' organisations the figure was 12%. The UK's coordinator ratio for HEIs, Public Bodies and Research Organisations is higher than the overall FP7 profile for the group in each case, which suggests that these organisations in the UK occupy more important roles in projects.

5.8 Collaboration patterns

One of the main objectives of the Framework Programmes is to promote and support collaboration between European and International actors in the research and technological development sphere. Below we summarise information on the collaboration patterns of UK participants in FP6 and F7, including their levels of collaboration with other UK organisations, with actors from different countries and with different types of organisation.

5.8.1 Collaboration patterns in FP6

Collaboration between UK organisations within FP6 projects

With 8,792 participations across 4,559 projects, it is clear that in some cases more than one UK partner was involved in the same FP6 project. In fact, there were 1,884 FP6 projects (41% of the projects in which UK was involved) with more than one UK partner involved. In a small number of projects (n=17) more than ten UK organisations were involved. These data suggest that the FP does have the potential to support knowledge transfer amongst UK organisations as well as between the UK partner(s) and those based in other countries.

An analysis of the extent of intra-UK collaboration within each of the FP6 Priority Areas revealed that there have been intra-UK collaborations within all 17 FP6 Priority Areas and that levels of intra-UK collaboration were highest (proportionately) in Euratom (75% of UK projects involved more than one UK participant), Aeronautics and space (66%), Food quality and safety (65%) and Horizontal research activities involving SMEs (63%). This distribution might have been expected: the UK has significant amounts of scientific and engineering competence in fusion and aerospace, two areas that are also very highly concentrated, and the SME-specific measures are almost always going to involve at least two organisations from the same member state (CRAFT and its successors was designed to engage smaller firms with little or no in-house research capability by exploiting RTOs' commercial relationships; the RTOs bring their clients and 'friends' of their clients to Framework). The surprise area is food, which suggests the UK has some internationally significant clusters in this area that are ready to work together.

Collaboration with actors from different countries

There were 43,032 participations by organisations from other countries in UK FP6 projects, with the partners being drawn from a total of 119 different countries.

In volume terms the greatest number and share of collaborations took place with partners in Germany and France (16% and 12% of collaborations each), followed by Italy (~10%), Spain (~8%) and the Netherlands (~7%). However, this reflects mainly the high levels of participation in FP6 by these countries as a whole.

A better indicator of the strength of collaboration between UK and other countries is the ratio of each country's share of all participations in UK projects to their overall share of FP6 participations. Using this indicator, the most active Member State collaboration partners were Denmark, Ireland, the Netherlands and Sweden while the least active were Romania, Cyprus, Malta and Slovakia.

The greatest numbers of collaborations with non-EU Member States were with Switzerland and Norway, with over 900 participations each. Norway is also one of the most significant collaboration partners (proportionally) amongst non-EU Member States, as well as South Africa and Iceland. All of these countries collaborated with the UK at a level 15+% higher than might have been expected given their overall levels of participation.

Collaboration between different types of organisation

The partners in the UK FP6 projects break down by organisation type as follows: Higher Education (HES) – 38%; Industry (IND) – 19%; Research (REC) – 28%; Other (OTH) – 15% (excludes undefined records). This is broadly in line with overall FP6 participation breakdown. Therefore, whilst HEIs dominate the UK's participation profile (56%), this has not led to a significantly different pattern of collaboration partners.

5.8.2 Collaboration patterns in FP7

Collaboration between UK organisations within FP7 projects

With 3,679 UK participations across 2,204 FP7 projects, it is clear that a number of these projects involve more than one UK partner. In fact, there have been 824 FP7 projects with more than one UK partner involved (37% of all projects with UK involvement). These data indicate a good level of intra-UK collaboration within FP7 projects, providing the potential for knowledge transfer between UK organisations as well as between the UK and other countries.

An analysis of the extent of intra-UK collaboration within each of the FP7 Priority Areas revealed that there have been intra-UK collaborations within all areas except General activities, Activities of international cooperation, Regions of knowledge and Research potential. Levels of intra-UK collaboration were highest (proportionally) in ERC and Space Areas (with 67% of UK projects in each Priority Area involving more than one UK participant).

Collaboration with actors from different countries

There have been 16,207 participations by organisations from other countries in UK FP7 projects, with the partners being drawn from a total of 120 different countries.

In volume terms the greatest number and share of collaborations took place with partners in Germany, France and Italy (with 16%, 11% and 10% of the collaborations respectively). However, this reflects the high levels of participation in FP by these countries. By looking at the ratio of each country's share of all participations in UK projects to their overall share of participations, we get a better view: on this analysis, the UK's most active Member State collaboration partners are Lithuania, the Netherlands and Germany, each with at least a 5% higher level of participation in UK projects than in all FP7 projects. With the exception of the Netherlands, each of the other top-5 'partner' countries has changed from FP6 to FP7. For FP7 to date, the least active Member State by this indicator is Latvia.

The greatest numbers of collaborations with non-EU Member States were with Switzerland and Norway, with over 589 and 324 participations each respectively. Australia and China are the most significant collaboration partners (proportionally) amongst non-European countries, collaborating with the UK at a level 20% higher than might have been expected given their overall levels of participation.

Collaboration between different types of organisation

The partners in the UK FP7 projects break down by organisation type as follows: Education – 40%; Private commercial – 26%; Public body – 6%; Research organisations – 26%; Other (OTH) – 2%. This is broadly in line with overall FP7 participation breakdown. Therefore, whilst education establishments dominate the UK's participation profile (61%), this has not led to a significantly different pattern of collaboration partners.

5.9 Demand for participation

5.9.1 Analysis of FP proposals

A full database of UK participations in FP6 proposals was made available to the study team by BIS, permitting analysis of both 'levels of demand' (presented here) and 'success rates within the competition' (presented in Section 5.10 below). In addition, up-to-date information on all proposals submitted to FP7 was taken from the E-Corda database (1st November 2009 release).

5.9.2 Demand for participation in FP6

Proposals submitted to FP6 with UK participation

Following cleaning of the FP6 application data, the number of discrete *proposals* in which UK applicants were named as prospective participants was calculated to be 22,333. Data published by the European Commission indicates that the total number of proposals submitted to FP6 overall was 55,597, so we can calculate that the UK's participation rate within the proposals was 40.2%. This is an indicator of the level of 'demand' for involvement in FP6 projects by UK organisations.

Figure 20 shows the breakdown of FP6 proposals with UK involvement, by priority area. In terms of numbers alone, proposals with UK participation were most numerous in the Human resources and mobility and Information society technologies areas, with over 4,300 UK proposals in each case.

The Figure also shows the breakdown of *all* FP6 proposals by Priority Area. By comparing all proposals with those with UK participation, the final column gives an indication of the *relative* level of demand for involvement in each area. It shows that the UK's proposal participation rate was highest in proposals submitted to the Citizens and governance, Sustainable development, Nanotechnology, IST, Aeronautics and Life priority areas (with UK participation in at least half of all proposals in each case).

The UK's proposal participation rate was lowest in Support for international cooperation, Human resources and mobility, Science and Society and Euratom areas (with UK participation in less than one-third of proposals in each case).

Figure 20 – UK's participation in FP6 proposals, by Priority Area

Priority	All proposals	UK proposals	Demand - share of bids with UK involvement
1. Life sciences, genomics & biotechnology	2,442	1,244	51%
2. Information society technologies	7,627	4,313	57%
3. Nanotechnologies and nanoscience	2,810	1,628	58%
4. Aeronautics and space	805	450	56%
5. Food quality and safety	1,145	563	49%
6. Sustainable development	2,763	1,598	58%
7. Citizens and governance	886	634	72%
Policy support / S&T needs	2,745	1,351	49%
Horizontal research activities - SMEs	3,980	1,871	47%
Support for international cooperation	2,759	655	24%
Research and innovation	762	288	38%
Human resources and mobility	23,464	6,774	29%
Research infrastructures	514	239	46%
Science and society	1,406	407	29%
Support for the coordination of activities	241	100	41%
Development of R & I policies	140	54	39%
Euratom	321	103	32%
Unassigned	0	61	-
Total	**55,957**	**22,333**	**40%**

Source: FP6 proposal data (BIS, December 2009)

An analysis of FP6 proposals with UK participation by type of instrument was also carried out. In terms of numbers alone, proposals with UK participation were highest for Marie Curie Actions, Specific Targeted Research Projects (STREPs) and Specific Support Actions, with over 6,900 proposals in each case. The UK's proposal participation *rate* (i.e. share of all submitted proposals) was highest in relation to Networks of Excellence, Integrated Projects, Coordinated Actions and STREPs (at least half of all proposals in each case).

It is also worth noting that the role of coordinator was assigned to a UK participant in 20% of the FP6 proposals with UK participation.

UK *participations* in proposals submitted to FP6

The number of UK *participations* in FP6 proposals was calculated as 40,724. The Commission data[9] indicates that there was a total of 389,737 participations in all of the submitted proposals received under FP6, so the UK's share of the participations in proposals is calculated as 10.4%. This is an indicator of the level of 'demand' for participation in FP6 by UK organisations.

Figure 21 provides a breakdown of UK participations in FP6 proposals by type of organisation. It shows both the number of participations and the share of participations accounted for by each group, and therefore an indication of the relative level of demand for involvement by each type. It indicates that the majority of UK proposal participations were accounted for by HEIs. No data on participation by each group in FP6 proposals overall is available, so it is not possible to determine whether the profile of UK demand is similar to that for all countries.

[9] This data includes both, eligible and ineligible applications

Figure 21 – UK participation in FP6 proposals, by type of organisation

Organisation Type	Number of UK participations	Share of all UK participations
Higher Education	21,818	55%
Industry	8,743	22%
Research Institutes	5,639	14%
Other	3,693	9%
Total[10]	**39,960**	**100%**

Source: FP6 proposal data (BIS, December 2009) *Note that organisation type is unknown in 1010 cases

5.9.3 Demand for participation in FP7

Proposals submitted to FP7 with UK participation

The number of discrete FP7 *proposals* to date in which UK applicants were named as prospective participants was calculated to be 16,184. The total number of proposals submitted to FP7 overall has been 45,994, so the UK's involvement rate within submitted proposals has been 35.2%.

Figure 22 shows the number of FP7 proposals, number of proposals with UK involvement and share of proposals with UK involvement, by area. It shows that the share of proposals with UK involvement has been highest in the Health, Socio-economic science and humanities and Research infrastructures areas (over 60% of proposals have UK involvement in each case). UK involvement in FP7 proposals has been lowest in the Activities of international cooperation, Regions of knowledge, European Research Council and Research potential areas (less than one-quarter of proposals have UK involvement in each case). However, there are some rule-based issues here, where collaborative proposals are required to include many partners while an ERC proposal is made by a single researcher, so it is possible to achieve a high share in many areas but not all. The ERC proposal and proposal participation rates will be broadly equal, and a rate of 14% is quite reasonable given the size of the UK public-sector research base. It suggests that the UK has been responsible for 1 in 7 proposals submitted in this area.

[10] The figure does not include 764 UK participations in proposals where the activity type is not specified

Figure 22 – UK's participation in FP7 proposals, by Priority Area

Priority	All proposals	UK proposals	Demand - share of bids with UK involvement
Energy	1,157	459	40%
Environment (incl. Climate Change)	1,386	797	58%
Food, Agriculture, & Biotech.	1,312	699	53%
General Activities (Annex IV)	45	14	31%
Health	2,501	1,531	61%
Information and Communication Technologies	5,521	3,110	56%
Nanoscience, Nanotechnologies, Materials & NPT	2,359	764	32%
Security	624	346	55%
Socioeconomic science. & Humanities	1,442	873	61%
Space	208	106	51%
Transport (including Aeronautics)	1,414	786	56%
Activities of International Cooperation	194	44	23%
Coherent development of research policies	23	7	30%
Regions of Knowledge	261	57	22%
Research for the benefit of SMEs	1,888	988	52%
Research Infrastructures	463	282	61%
Research Potential	1,277	36	3%
Science in Society	480	226	47%
Marie-Curie Actions	9,435	3,027	32%
European Research Council	13,860	1,952	14%
Fusion Energy	10	4	40%
Nuclear Fission and Radiation Protection	134	76	57%
Total	**45,994**	**16,184**	**35%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

An analysis of FP7 proposals with UK participation by type of instrument was also carried out. It revealed that the level of UK involvement varies considerably, driven mainly by the nature of the instruments themselves (i.e. rules on eligibility and consortia). So, for example, the UK's involvement rate is highest for the larger, multi-partner actions such as Networks of Excellence, Collaborative Projects and Research for the Benefit of Specific Groups. Similarly, involvement rates have been lower in 'single partner' actions such as the Support for Frontier Research actions employed within the ERC priority area.

UK participations in proposals submitted to FP7

The number of UK *participations* in FP7 proposals to date was calculated as 25,618. There has been a total of 235,750 participations in all submitted proposals under FP7, so the UK's share of the participations in proposals is calculated as 10.9%. This is an indicator of the level of 'demand' for participation in FP7 by UK organisations and is very slightly above the FP6 rate.

Figure 23 shows the level of UK participation in FP7 proposals to date by each main type of participant. It reveals that the UK's share of all participations in proposals has been highest within the HEI sector, accounting for 15% of all participations in proposals, followed by private commercial (industry) organisations.

Figure 23 – Demand – share of bids with UK involvement in FP7 proposals, by type of organisation

	All participations in proposals	UK participations in proposals	Demand – share of proposal participations
Higher or secondary education est.	89,853	13,628	15%
Private commercial	56,296	5,476	10%
Public body (excl. res. and educat.)	10,247	742	7%
Research organisations	44,460	2,210	5%
Others	17,266	1,458	8%
Total[11]	**235,750**	**25,618**	**11%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

5.10 UK proposal success rates

5.10.1 UK proposal success rates in FP6

UK organisations participated in 22,333 FP6 proposals and in 4,559 FP6 projects. The UK's overall project-level success rate was therefore 20.5%, which is significantly better than the average success rate for FP6 as a whole (18.0%). At 18%, 22,000 applications would have produced around 4,000 projects, around 500 projects fewer than the actual outturn. This indicates that proposals with UK participation have performed well.

Figure 24 shows the success rates of proposals with UK participation by Priority Area and compares these to the overall success rates for all proposals submitted to FP6. It shows that UK proposal success rates were above the FP6 average in 16 of the 17 Priority Areas (only Research and Innovation had a slightly lower success rate than the FP6 average), with the UK performing particularly well in Euratom, Coordination of activities, Policy support for S&T, Science and society, and Food quality and safety areas. In each of these areas UK success rates were more than 50% above FP6 averages.

The same analysis for UK *participations* in proposals reveals that the UK participation-level success rates were above the FP6 averages in 14 out of 17 areas (ICT, Research Infrastructures and Development of R&I policies were below the average). The UK performed particularly well in the following areas: Euratom; Horizontal research activities – SMEs; Aeronautics and Space; Life Sciences; Science and society; and Sustainable development.

Comparing success rates of proposals with UK participation by instrument with the overall success rates for all proposals submitted to FP6 shows that UK proposal success rates were above the FP6 average for all of the 10 main categories of instrument. The UK performed particularly well in relation to Integrated Projects, SME-specific actions and infrastructure (I3) projects.

Comparing success rates of UK participations in proposals submitted to FP6 by organisation type suggests that success rates were highest amongst participations from 'other' (26%) organisations and Research Institutes (23%), followed closely by Higher Education (22%), while success rates for participations from Industry (19%) were lower. Unfortunately comparative data showing the success rates for all proposals by organisation type was not available.

[11] Figures include participations where organisation type is not identified (2,104 participations of UK proposals and in 17,628 participations of all FP7 proposals)

Figure 24 – UK and all FP6 proposal success rates by Priority Area

Priority	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP6	Ratio of UK success rates to FP6 success rates
1. Life sciences, genomics & biotechnology	1,244	388	31%	24.5%	127%
2. Information society technologies	4,313	667	15%	14.3%	108%
3. Nanotechnologies and nanosciences	1,628	269	17%	15.8%	104%
4. Aeronautics and space	450	166	37%	29.9%	123%
5. Food quality and safety	563	121	21%	16.2%	133%
6. Sustainable development	1,598	387	24%	24.0%	101%
7. Citizens and governance	634	115	18%	16.5%	110%
Policy support / S&T needs	1,351	338	25%	19.0%	132%
Horizontal research activities – SMEs	1,871	296	16%	12.3%	129%
Support for international cooperation	655	103	16%	12.4%	127%
Research and innovation	288	88	31%	31.1%	98%
Human resources and mobility	6,774	1,335	20%	19.5%	101%
Research infrastructures	239	89	37%	30.0%	124%
Science and society	407	73	18%	11.5%	157%
Support for the coordination of activities	100	60	60%	42.3%	142%
Development of R & I policies	54	9	17%	13.6%	123%
Euratom	103	55	53%	24.3%	220%
Unassigned	61	0	-	-	-
Total	**22,333**	**4,559**	**20%**	**18.0%**	**114%**

Source: FP6 proposal data (BIS, December 2009)

5.10.2 UK proposal success rates in FP7

The UK's overall proposal-level success rate for FP7 to date is 14%, significantly above the average success rate figures for FP7 as a whole (11%); both percentages will rise as the number of signed contracts increases and approaches 100% of all projects supported as a result of the first two calls. The fact that the UK's proposal-level success rate in FP7 is below its success rate for FP6 (20%) is not cause for alarm.[12]

Figure 25 shows the success rates of proposals with UK participation by Priority Area and compares these to the overall success rates for all proposals submitted to FP7. It shows that UK proposal success rates were above the FP7 average in 17 of the 22 Priority Areas, with the UK performing particularly well in the following areas, where UK success rates were more than 30% higher than the FP7 averages: Fusion Energy, Nanotech, Science in Society, European research Council, Socioeconomic science and humanities, and Food, Agriculture and Biotech. UK proposal success rates were below average in relation to the FP average in Regions of Knowledge, General Activities, Activities of International Cooperation, Marie-Curie Actions and Coherent development of research policies.

The same analysis for UK *participations* in proposals reveals that the UK participation-level success rates were above the FP7 averages in 15 of the 22 Priority Areas. In particular, UK success rates are over 30% higher than FP7 averages in four areas: Environment, Science in society, European research council, and Socio-economic science and Humanities.

UK participation-level success rates have been below the FP7 average in General activities, Security, Space, Transport, Activities of international cooperation, and Regions of knowledge Areas.

Comparing success rates of proposals with UK participation by instrument with the overall success rates for all proposals submitted to FP7 shows that UK proposal success rates were above the FP7 average for all-but-one of the instruments.

Comparing success rates of UK participations in proposals submitted to FP7 by organisation type with overall success rates suggests that success rates were in-line with or above the overall FP7 average for each group. Education establishments in the UK have so far performed particularly well, achieving a participation-level success rate of 16%, compared with 13% for these organisations overall.

[12] Because FP7 is still underway and because of the way in which the Commission presents its data, it is not possible to provide a definitive analysis of success rates within FP7 at this stage. While we can provide an accurate and up to date picture of the numbers of proposals submitted and the level of UK involvement in these, not all of those proposals have been assessed and not all of the successful proposals have yet proceeded to contract stage and been entered into the participation (contracts) database. As such, the calculated success rates while FP7 is still in train are significantly lower than the actual true success rates that will ultimately be achieved. This is true for all of the data reported here (i.e. overall FP7 success rates and UK success rates).

Figure 25 – UK and all FP7 proposal success rates by Priority Area

Priority	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP7	Ratio of UK success rates to FP7 success rates
Energy	459	54	12%	9%	130%
Environment (including Climate Change)	797	97	12%	10%	122%
Food, Agriculture, and Biotechnology	699	86	12%	9%	132%
General Activities (Annex IV)	14	3	21%	31%	69%
Health	1,531	238	16%	13%	120%
Information and Communication Technologies	3,110	345	11%	11%	104%
Nanoscience, Nanotechnologies, Materials and NPT	764	120	16%	8%	194%
Security	346	30	9%	8%	108%
Socio-economic sciences and Humanities	873	80	9%	7%	132%
Space	106	12	11%	10%	112%
Transport (including Aeronautics)	786	117	15%	13%	115%
Activities of International Cooperation	44	6	14%	16%	85%
Coherent development of research policies	7	3	43%	48%	90%
Regions of Knowledge	57	5	9%	13%	69%
Research for the benefit of SMEs	988	103	10%	9%	112%
Research Infrastructures	282	107	38%	30%	127%
Research Potential	36	3	8%	6%	130%
Science in Society	226	49	22%	15%	147%
Marie-Curie Actions	3,027	586	19%	22%	90%
European Research Council	1,952	134	7%	5%	146%
Fusion Energy	4	3	75%	30%	250%
Nuclear Fission and Radiation Protection	76	23	30%	24%	127%
Total	**16,184**	**2,204**	**14%**	**11%**	**123%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

5.11 Comparing UK participation and success rates

5.11.1 Comparing UK participation and success rates in FP6

The two columns of Figure 26 present the data on the ratio of UK FP6 participation rates and success rates relative to FP6 rates overall, by priority area. The 'UK FP6' and 'all FP6' success ratios are presented in Figure 26, with the ratio of one to the other shown in the final column. So, for example, in the case of the life sciences areas, the success rate for proposals including at least one UK partner was 31%, while the success rate for all FP6 life sciences proposals was 24.5%, which means UK proposals were 127% more likely to be successful than the average for all proposals. These data have been normalised to allow better comparisons with the participation ratios (which naturally total 100%).

Each cell is marked as 'low', 'medium' or 'high,' with the highest six ratios marked as 'high', the lowest six ratios marked as 'low' and the remainder marked as 'medium'. For example, the share of UK participation accounted for by Sustainable development is considerably lower than the share of all participations accounted for by this priority area. In fact the UK's share is 19% lower than the FP6 rate overall, hence the 81% ratio and the 'low' designation. At the same time, UK success rates in the same area are 'high' (10% above the overall success rates).

The UK has relatively high participation rates *and* success rates in Life sciences, genomics & biotechnology, Aeronautics and space and Horizontal research activities (for benefit of SMEs). These are clearly areas of strong performance for the UK. In addition, in Human resources and mobility, Citizens and Governance, and Policy support/S&T needs areas, success rates are above FP6 averages (even though they are ranked and marked as 'medium') and participation rates are relatively high.

The UK has relatively low participation rates in Sustainable development, Support for international cooperation, Research and Innovation, Research Infrastructures, Support for the coordination of activities and Development of R & I policies. The UK has also got low success rates for all of these priority areas except Research infrastructures.

Figure 26 – Comparison between UK relative success and participation rates in FP6

Priority	UK success ratio (SR) (Ratio of UK to FP6 participation success rates)	UK participation ratio (PR) (Ratio of UK to FP6 participation rates)
1. Life sciences, genomics & biotechnology	High (113%)	High (114%)
2. Information society technologies	Low (86%)	Medium (89%)
3. Nanotechnologies and nanosciences	Low (91%)	Medium (87%)
4. Aeronautics and space	High (112%)	High (103%)
5. Food quality and safety	Medium (107%)	Medium (97%)
6. Sustainable development	High (110%)	Low (81%)
7. Citizens and governance	Medium (101%)	High (107%)
Policy support / S&T needs	Medium (104%)	High (110%)
Horizontal research activities - SMEs	High (126%)	High (119%)
Support for international cooperation	Low (100%)	Low (49%)
Research and innovation	Low (94%)	Low (60%)
Human resources and mobility	Medium (103%)	High (158%)
Research infrastructures	Low (78%)	Low (85%)
Science and society	High (112%)	Medium (88%)
Support for the coordination of activities	Medium (109%)	Low (60%)
Development of R & I policies	Low (83%)	Low (50%)
Euratom	High (137%)	Medium (99%)
Total	100%	100%

Sources: Derived from FP6 participation data and FP6 proposal data (E-CORDA, 1st November 2009)

5.11.2 Comparing UK participation and success rates in FP7

The columns of Figure 27 present the same information on relative UK participation rates and success rates by priority area, but for FP7. The 'success ratios' have already been presented in Figure 25 but have this time been normalised and total to 100%.

UK participants have been doing particularly well (have 'high' participation rates *and* success rates) in Health, Socio-economic sciences and Humanities, Science in Society, Marie-Curie Actions and European Research Council Areas. In Health, Marie Curie Actions and ERC the participation ratios are higher than their corresponding success rates, suggesting that implied demand in these areas is high.

The UK has relatively low participation ratios in General Activities, Security, Space, Activities of International Cooperation, Coherent development of research policies, Regions of Knowledge and Research Potential.

Figure 27 – Comparison between UK's relative success and participation rates in FP7

Priority	**UK success ratio (SR) (Ratio of UK to FP7 participation success rates)**	**UK participation ratio (PR) (Ratio of UK to FP7 participation rates)**
Energy	Medium (99%)	Medium (79%)
Environment (including Climate Change)	High (119%)	Medium (96%)
Food, Agriculture, and Biotechnology	Medium (99%)	Medium (80%)
General Activities (Annex IV)	Low (55%)	Low (32%)
Health	High (108%)	High (119%)
ICT	Low (86%)	Medium (85%)
Nanotech	Medium (93%)	Medium (84%)
Security	Low (80%)	Low (77%)
Socio-economic sciences and Humanities	High (131%)	High (118%)
Space	Low (83%)	Low (71%)
Transport (including Aeronautics)	Low (87%)	Medium (84%)
Activities of International Cooperation	Low (52%)	Low (17%)
Coherent development of research policies	High (112%)	Low (54%)
Regions of Knowledge	Low (30%)	Low (13%)
Research for the benefit of SMEs	Medium (95%)	High (106%)
Research Infrastructures	Medium (96%)	Medium (100%)
Research Potential	Medium (103%)	Low (18%)
Science in Society	High (143%)	High (113%)
Marie-Curie Actions	High (107%)	High (149%)
European Research Council	High (148%)	High (163%)
Fusion Energy	Medium (99%)	High (104%)
Nuclear Fission and Radiation Protection	Medium (95%)	Medium (85%)
Total	**100%**	**100%**

Sources: Derived from FP7 participation data and FP7 proposal data (E-CORDA, 1st November 2009

5.12 UK participation in related initiatives

5.12.1 UK involvement in FP7 evaluation panels

Involvement of national experts in the evaluation panels that assess proposals submitted to FP calls provide an opportunity to expand the experience base of UK academics and industrialists in the 'inner workings' of the Commission and its assessment procedures. Interviews with panel members carried

out as part of previous FP evaluations have confirmed that the experience gained through this work provides valuable insight into how proposals are assessed, what kinds of information and arguments evaluators are looking for, and the critical differences between successful and unsuccessful proposals. Such experience is felt to significantly enhance the ability of participants to write successful proposals, increasing their level of success in the competitions and cutting down on abortive costs associated with the preparation of unsuccessful proposals.

Technopolis obtained data on the level of involvement of UK experts in the 2007 and 2008 evaluation panels that assessed proposals submitted under the first FP7 calls. This data reveals that UK experts made up 10.7% and 10.6% of the 2007 and 2008 FP7 evaluation panel members respectively, slightly below the level of UK participations in FP7 to date (12%).

UK experts were involved to differing degrees depending upon the Priority Area. Aggregated across the first two FP7 calls, UK involvement was highest in the following areas (figures in parentheses show the proportion of panel members from the UK):

- Euratom (22.9%)
- Science in Society (14.7%)
- Health (12.8%)
- Information and Communication Technologies (12.0%)
- European Research Council (11.8%)

The proportion of UK experts, involved FP7 evaluation panels, was lowest in the following areas:

- Environment (8.3%)
- ERA-NET (8.0%)
- Socio-economic Sciences and Humanities (7.7%)
- Regions of Knowledge & Activities of International Cooperation (6.8%)
- Research potential (4.3%)

CORDIS has also published a list of Expert Evaluators for the Ethics Review 2009-2010 where UK evaluators make up 11 out of a total of 112 experts (9.8%).

5.12.2 UK involvement in the ERA-NET scheme

The ERA-NET scheme was launched alongside FP6 to facilitate increased co-operation / co-ordination of national or regional research and innovation programmes. The instruments used for implementing the ERA-NET Scheme were the Co-ordination Actions (CAs, for fully fledged proposals) and the Specific Support Actions (SSAs), which were used to prepare CAs.

DG Research data indicates that under the FP6 ERA-NET Scheme, UK participation – excluding coordinators – made up 6.8% of total participation. This is the fourth highest level of participation by any country, after Germany (11.4%), France (9.1%) and the Netherlands (8.0%).

In addition, the data suggests that 10.9% of the selected proposals had a UK-based coordinator. This is the fourth highest level of coordination by any country, behind only Germany (21.7%), France (20.7%) and the Netherlands (15.2%).

Under FP7, ERA-NET calls have been more closely aligned with the FP's thematic areas. However, perhaps to compensate for this more top-down approach – when the original concept had very much been about bottom-up partnerships of variable geometry – FP7 also ERA-NET Plus for ERA-NETs with proposed programmes of work that have an adjudged "high European added value."[13] In essence, the Commission co-financing member state programmes in order to encourage greater interest in the scheme in general and to increase the number and value of cross-border funded programmes.[14]

No data was available to compare FP7 ERA-NET participation by the UK with that of other countries. However, data received from BIS suggests that UK organisations have so far (2007-2009) submitted proposals for 29 ERA-NET actions, with a UK coordinator in five of these cases. These proposals covered seven areas: General Activities (8 proposals), Environment (4), Food, Agriculture and Fisheries, and Biotechnology (4), Nanoscience, nanotechnologies, materials and new production technologies (4), Socio-economic sciences and humanities (4), Transport (3), and Health (2). Twenty-one of the UK proposals have been successful, including three headed by a UK-based coordinator.

The number of ERANET proposals involving one or more UK partners has decreased over the life of FP7, from 12 per year in 2007 and 2008 to 5 in 2009, however the success rate of UK proposals has increased each year, from 67% (2007), to 75% (2008), to 80% (2009).

5.12.3 UK involvement in Article 169 actions

Article 169 (of the EU Treaty[15] foresees the possibility of the Commission supporting / participating in R&D programmes defined by Member Stats directly. In essence, it is a heavyweight version of the ERA-NET Scheme for EU national or federal government bodies, and is intended to achieve increased co-ordination of national and regional research activities throughout Europe (for all of the usual reasons to do with efficiency and effectiveness). Article 169s require substantially more effort to set up than does an ERANET, and so they have tended to be used where there is wide-ranging support and commitment to a given set of issues (e.g. the Eurostars programme, which subsidises the cost of carrying out commercially-oriented applied research involving smaller firms).

Four Article 169 initiatives were being supported under FP7, and UK participation data was identified in relation to two of these:

Ambient Assisted Living Joint Programme (AAL) - The aim of the AAL Joint Programme is to improve the quality of life for older people and to strengthen the industrial base in Europe through the use of ICT. It has released reports on its first two calls for proposals (AAL-2008-1 and AAL-2009-2). Partner statistics for the initial call (AAL-2008-1) suggest that the UK lies around average out of 23 partner countries for "number of partners per country". Out of a total of 23 projects funded under the first call, four projects included one UK organisation, while a fifth project was led by a UK coordinator and included three UK participating organisations.

A total of 104 proposals, including a total of 762 partners, were received in response to the second call (AAL-2009-2), of which UK partners numbered just under 40 (~5%) and five proposals were led by UK coordinators (~5%). The available data does not reveal the number of successful proposals, however it does state that the independent evaluators assessed 41 of the proposals 'positively', and that these proposals included 327 partner organisations. UK coordinators led two of these proposals, and UK organisations accounted for 15 of the partner organisations involved (4.6%).

Eurostars Programme - The Eurostars Programme includes 32 partner states and has contracted to invest around EUR 100 million following its 2008 call for proposals, split 75:25 member states and Commission. It specifically targets SMEs and funds collaborative market-driven R&D projects where SME participants have a prominent role. The Technology Strategy Board, as the national UK contact,

[13] cordis.europa.eu/fp7/coordination/eranet_en.html

[14] ERANET programme budgets are expected to be provided by the project partners, however this requires sponsors to find new money or switch funds from national and other research and innovation activities, which has proved to be a disincentive and or led to a distortion of the single-pot – programme budget – to address research of common interest. In practice, sponsors have made commitments in principal and asked to invest on a case-by-case basis and only providing funding to domestic organisations. Tightening public finances are likely to exacerbate this tendency.

[15] Now Article 185 of the Lisbon Treaty

has published data[16] on the 2008 call, which was the first call for proposals in which the UK participated. Only research-intensive SMEs were eligible to receive funding in the UK; other partners would need to obtain funding from other sources.

The 2008 call received a total of 317 proposals, of which 245 were eligible for ranking. The TSB states that 61 applicants from the UK were included within 57 of these proposals (~18%) and 17 of the proposals had a UK lead applicant. Funded UK projects covered 11 sectors, including electronics, industrial/products/manufacturing and medical/health related sectors (with 3 projects in each).

5.12.4 UK involvement in European Technology Platforms

European Technology Platforms (ETPs) were launched fully in FP6, having been trialled by the aeronautics industry in FP5 (ACARE). They are industry-led frameworks addressing important and emerging technology areas, where Commission support helps to bring together private and public stakeholders to develop a European-level strategic research agenda. The process has parallels with the Innovation and Growth Teams supported by BIS, and is intended to focus attention and minimise unnecessary duplication and misdirected investments. In practice, the ETPs have emerged as planning frameworks for the FP, helping to define priority areas for FP7 – even informing the definition of individual calls and projects – and readying contributors for those calls.

The rationale is much less to do with writing FP work programmes of course and much more to do with strengthening industrial engagement in EU-level research and innovation activities and developing the ERA. The Evaluation of the ETPs (August 2008)[17] reported several noteworthy findings: on business engagement, it found that large firms and research institutes are well represented throughout the ETPs, however most other stakeholders and in particular smaller firms and end-users are much less engaged. Notwithstanding this, the balance of opinion across all stakeholder groups was that the strategic research agendas were broadly in line with their own sense of the critical issues. The findings on coordination were rather mixed, with positive feedback on alignment between the SRAs and the FP, some concerns over proliferation and duplication of effort across ETPs and a general view that the research strategies had so far had little impact on member state agendas.

The Fourth Status Report on ETPs ('Harvesting the potential', August 2009)[18] lists the developments so far for the 36 ETPs active as at February 2010, however it does not provide comprehensive participation statistics so one cannot easily review either national or industry participation. Informally, using the ETP's own websites, some 25 provide membership information of some kind, and perhaps reassuringly, the UK is involved in every case. In several cases, there are tens of UK organisations involved in an individual ETP.

5.12.5 UK involvement in Joint Technology Initiatives

FP7 saw the launch of the Joint Technology Initiatives (JTIs), which in practical terms amount to a mechanism through which the Commission can co-finance the kinds of strategic pan-European research programmes defined by the ETPs.

They differ from ERANETs and Article 169s inasmuch as they are mission oriented, with a strong commercial focus, and substantial industrial programme-level funding to match the Commission's investment, and additional income from MS where possible. They differ from the FP thematic priorities inasmuch as the competition revolves around programmes rather than projects, and they differ from a scheme such as EUREKA inasmuch as they anticipate supporting a broader range of interventions: research infrastructure, education, SME support and international collaboration.

There are currently five JTIs operating. As they are independent entities, there is no central source of information and limited data is available that would help determine the extent of UK participation. However, BIS provided some limited information about UK participation in three of the five JTIs:

[16] Breakdown of Eurostars 2008 call funded projects: www.innovateuk.org/_assets/pdf/eurostars%2008%20call%20breakdown.pdf
[17] Evaluation of the European Technology Platforms (ETPs), Final report, IDEA Consult, August 2008:ftp://ftp.cordis.europa.eu/pub/technology.../evaluation-etps.pdf
[18] ftp://ftp.cordis.europa.eu/.../technology-platforms/.../etp4threport_en.pdf

- Aeronautics and Air Transport (Clean Sky) - Approximately 55 proposals were submitted from UK organisations for the 2009 call, of which 43 "passed evaluation" (although it is unclear whether they were funded). The majority of proposals were from private companies, while the remainder were from HEIs and research organisations
- Embedded Computing Systems (ARTEMIS) - Under the 2008 call there were 12 funded projects, of which 4 involved UK partners
- Fuel Cells and Hydrogen (FCH) - In the 2008 call, 5 of the 11 UK proposals submitted "passed evaluation", while in the 2009 call 27 of the 47 UK proposals submitted passed
- Innovative Medicines (IMI) – No information identified
- Nanoelectronics Technology 2020 (ENIAC) – No information identified

6. Participant survey analysis

6.1 Introduction

During February 2010, an online survey questionnaire was directed to all UK participants in FP6 and FP7. It sought to explore the extent to which FPs have leveraged areas of UK strength and helped introduce new areas of expertise, as well as profile the benefits of UK participation. A total of 1,208 participants provided a usable questionnaire return out of a pool of 6,732 possible respondents, giving an overall response rate of 18%.

There was also a good level of response from each organisation type (HES, REC, IND, OTH), with at least 70 responses from each main category. Figure 28 shows the distribution of the UK's combined FP6 and FP7 participations by type of organisation and compares this to the distribution of survey responses. Despite some small differences (a slightly high response rate from HEIs and a slightly low response rate from "other" organisations), the distribution of responses is broadly in line with their overall share of combined FP6 and FP7 participations and we feel able to conclude that the responses provide a reliable sample from which to draw conclusions.

Figure 28 – Share of participations and survey responses, by type of organisation

Organisation type	Share of UK's combined FP6 and FP7 participations	Share of responses
HEIs	7,109 (57%)	723 (60%)
Industry[19]	2,444 (20%)	247 (20%)
Research Institutes[20]	1,686 (14%)	168 (14%)
Other[21]	1,154 (9%)	70 (6%)
Total	12,393 (100%)	1,208 (100%)

Sources: FP6 and FP7 participation data (E-CORDA, December 2010) and Survey of UK participants in FP6/7 (Technopolis, February 2010)

The questionnaire data was analysed in order to determine the pattern of responses for each question. In a small number of cases separate analyses was carried out by certain sub-groups of respondents. The main findings from the participant survey are presented below.

6.2 Alignment between FP support areas and UK research strengths

6.2.1 Relevance of FP6/7 research topics and instruments

Questionnaire respondents were asked to rate the relevance of FP6 and FP7 research topics and instruments, from the perspective of their own organisation or research group. The results are shown in Figure 29 and indicate that the majority of participating organisations have provided 'high' ratings for both programmes:

- Ratings assigned to the relevance of FP *research topics* are slightly higher than for the FP instruments, with almost two-thirds of participants rating research topics as of high relevance and only ~10% rating them as of low relevance. There were no significant differences between FP6 and FP7 on this measure
- Ratings assigned to the relevance of FP *instruments* were also fairly high, with just over half of the participants rating the instruments as of high relevance and most of the remainder assigning a 'medium' rating. FP7 instruments attracted slightly higher ratings than those employed in FP6

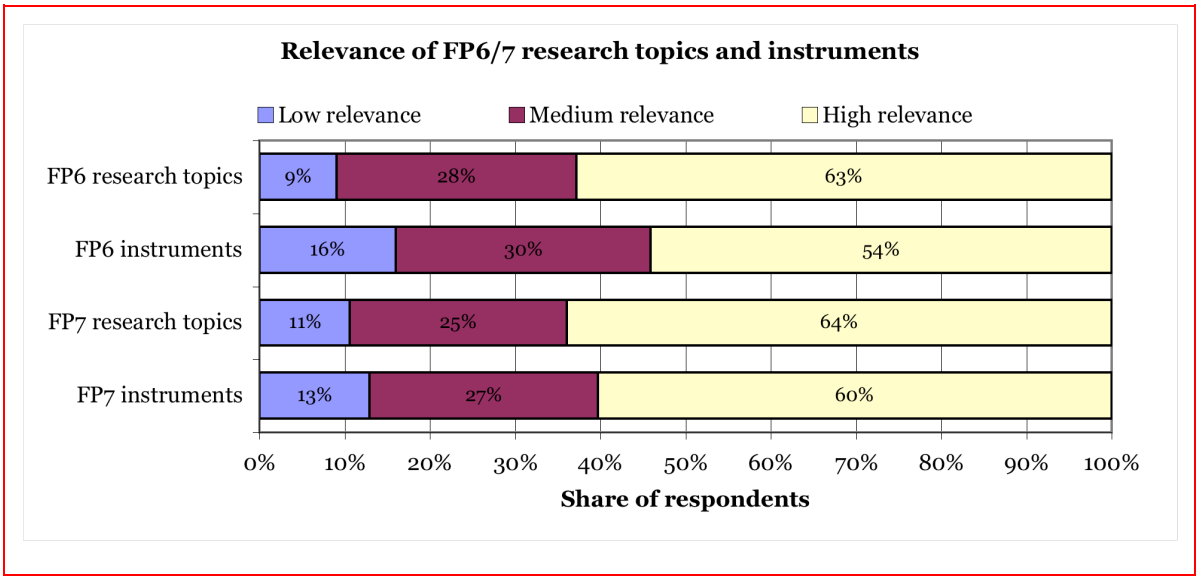
[19] Referred to as "Private commercial organisations" in FP7 (includes SMEs and large companies)

[20] Includes both, public and private research institutes

[21] Includes those participants whose activity type in FP7 is "Public body"

There were no major differences between the ratings assigned by different types of participant, although research institute and university respondents did assign slightly higher ratings overall. Industry participants assigned the lowest ratings overall, but only assigned significantly lower ratings than the other groups with regard to the relevance of FP6 instruments.

Figure 29 – Relevance of FP6/7 research topics and instruments (n=1,140)

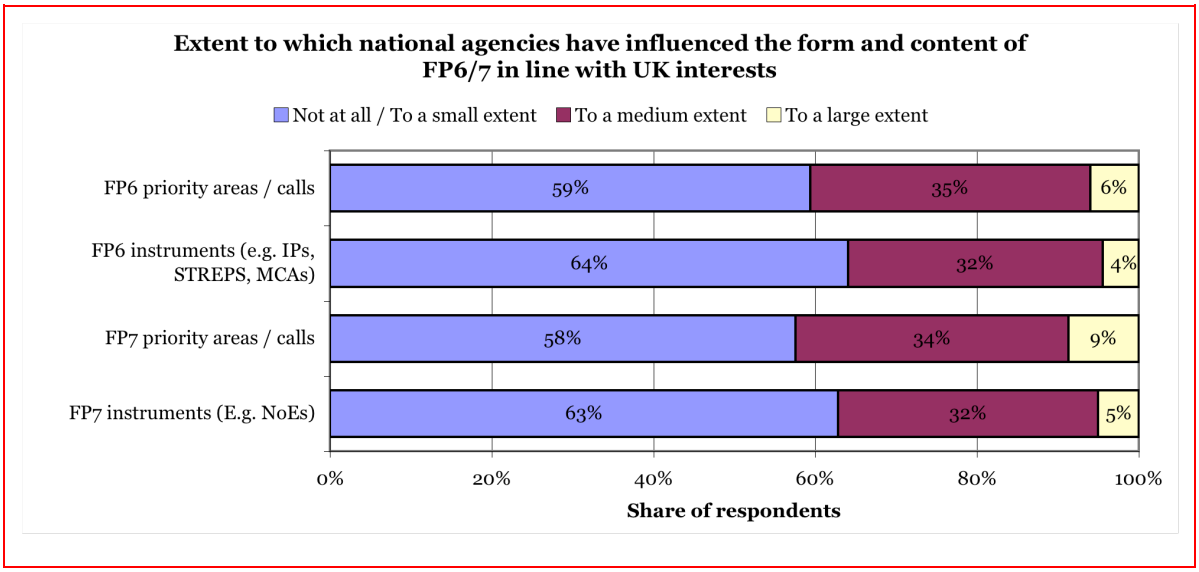


Technopolis survey of UK FP6/7 participants – Jan 10

6.2.2 Extent to which national agencies have successfully influenced the form and content of FP6/7

Participants were asked to indicate the extent to which they feel that national agencies and representatives have been successful in influencing the form and content (i.e. the thematic priorities and instruments) of FP6/7 in line with UK interests. The results obtained are presented in Figure 30 and indicate that the majority of respondents do not believe that national agencies or representatives have had a major influence on FP priorities or instruments. Influence on the priority areas and calls are rated as slightly higher than influence on the instruments. There was no significant difference between perceived national influence on FP7 themes and instruments, as compared with FP6.

Figure 30 – Extent to which national agencies have successfully influenced the form and content of FP6/7 (n=1,140)



Technopolis survey of UK FP6/7 participants – Jan 10

Respondents were asked to suggest any practicable means by which UK national agencies / representatives might increase the extent to which they influence FP planning, in order to increase its relevance to UK research communities. Two-thirds of survey respondents did not provide a response to this question, while a further ~15% reported that they did not know or were not in a position to comment. Some of these 'non-respondents' explained further that:

- They do not feel well informed about these matters and have had little or no contact or information from agencies / representatives in the past about the FP
- They are not aware of the current situation (e.g. which agencies are involved / responsible, how priorities are decided, who is consulted, what 'influencing' process or mechanisms are used, etc.) or how successful past efforts have been
- They do not have sufficient understanding of how a process of 'influencing the FP' might potentially work in the future and were unsure of the mechanisms available to national agencies and representatives in this regard

Where suggestions for action were given, these most commonly related to national agencies and representatives putting greater efforts into seeking inputs 'bottom-up' (i.e. from scientists, research groups and businesses) and to improving relationships and interaction with these groups (e.g. through meetings, consultations, focus groups and workshops, arranged with all types of participants, their organisations, representative bodies and existing networks). Many respondents provided further detail about the specific needs in this area and the justification for these activities, as follows:

- There is a need to brief / animate the research community in the UK about the processes by which the FP work programmes are developed and how they, as potential participants, might influence agendas. It is important for leading players to be active contributors to various EU-level committees that develop roadmaps and advice
- There is a need for national agencies / representatives to consult UK stakeholders earlier and more extensively, to ensure delegates to programme committees and advisory groups have a robust view of priorities
- There is a need for national agencies / representatives to provide (filtered) feedback and information on the priority areas and calls that are being formulated and any advanced drafts that are available, proactively seeking comment and feedback on these

Other suggestions for UK agencies and representatives that were regularly mentioned included:

- Generally taking a more proactive approach, raising objections where necessary and pushing hard for UK interests
- Ensuring greater transparency and coordination amongst national research strategies and (particularly) those of the FP, alongside better targeting of funding within the UK and additional financial assistance in accessing FP funds
- Improving coordination of the sometimes disparate approach to influencing the FP and increased coordination of efforts within the UK
- Assisting, encouraging and supporting the active participation of the research base ("senior scientists working alongside officials") in EC discussions in order to gain information and experience, provide knowledgeable input to developments and to provide feedback and information to the community
- Improving links between national agencies / representatives and the European Commission and increasing lobbying activity in Brussels

Other suggestions put forward by a small number of respondents included: case studying and publicising past UK successes; and providing specific targeted support to industry, in order to encourage involvement and interest and ensure industry needs are met through the FP.

6.2.3 Extent to which the FPs have filled 'gaps' in national funding

Participants were asked about the extent to which the FPs have provided support for research topics or issues that have not been addressed by the UK's national funding programmes.

Almost all of the respondents (94%) stated that in their view the FPs *had* filled gaps in national funding provision, with most stating that this has happened to a large (37%) or medium extent (42%). There were no significant differences in voting evident across research fields, or between the responses provided by different categories of participant (HEIs, industry, etc.).

Respondents were invited to elaborate on their adjudged rating, by itemising the particular topic or topics the FPs had supported, which had not been addressed by national research funds. The open invitation produced more than 800 individual statements, and Figure 31 presents a random set of 100 of those 800 statements to provide readers with a better understanding of the quality and particularity of the advice. The first point to note is that the very long list of statements did not produce a list of top 10 topics where multiple respondents had signalled the same gap. Beyond the generic remarks about support for European networks or collaboration, no single topic was cited more than 3 times, and the vast majority were proposed only once. From this perspective, the participants' feedback did not produce any obvious evidence regarding large gaps in national funding.

The body of material confirmed several widely held assumptions about the added value of the FP, and international research collaboration more generally, and specifically:

- Around 20% of the respondents cited instrumental benefits, rather than topical or thematic gaps per se. People simply noted the FP's basic modus operandi, supporting international research collaboration and networking, which marks it out from mainstream national funds. In other cases, commentators noted the FP's ability to support large-scale technology demonstration. In a minority of cases, people went on to say that the FP provides support for this kind of activity at a scale that goes far beyond anything available in the UK
- A significant minority cited the importance of the FP's international scope as a means by which to improve the robustness / efficiency of for example certain regulatory systems, from food safety to risk assessment, through the development of pan-European standards and toolkit. In a similar vein, respondents praised the international scope and the ability to carry out more penetrating research through comparative analyses, whether that was applied to more robust evaluation of a given therapeutic treatment or the assessment of policy effectiveness
- Around 20% of the respondents qualified their itemised, 'missing' topic with a comment about the limitations in the amount of funding available nationally. Their concern was with the sufficiency of national funding, rather than a gap per se, and an acknowledgement that the FP offers an appreciable additional source of research income

- In a minority of cases, respondents cited quite broad subject areas as being 'gaps in national funding,' including: basic biology, cancer research, computer games, energy, environmental science, international development and social theory. The comments imply concern over the sufficiency of national funding in key areas. Clearly, the UK does fund cancer research, energy research, and its investment in this broad area has increased very substantially in the past five years, and research into international development issues (DFID's research budget has been greatly expanded in the past 18 months)
- In a minority of cases, respondents commented on their discipline's changed circumstances, and the potential importance of the FP in helping to protect national capacity in subjects that have experienced a reduction in support nationally. There were several references to changing priorities and balance of funding within the EPSRC and the STFC

Figure 31 – A random selection of research topics reported to be missing from, or insufficiently addressed by, the UK's national research funds

Aerospace and Fission Metallurgy	Low input agricultural systems for developing countries
Agricultural research in developing countries	Metal matrix composites for aerospace applications
Aircraft noise reduction	Methodologies to support whole process understanding
Analysis of violent conflict	Microbiological aspects of food safety
Applied monitoring of radwaste storage	Multi-disciplinary approaches to medical interventions
Bathing water monitoring and epidemiology	Multi-sectoral climate change impacts within ecosystems
Bio. mineral processing, life in extreme environments	Nanosafety and the use of non-animal based systems
Blast protection, security	Novel Antenna Systems and techniques
Building novel high frequency 2/5 semiconductors	Numerical astrophysics (code development)
Carbon capture and storage	Offshore wind - wake effects
Chemical Eng for Biotech applications	Organised crime research
Citizen identity / identity management	Outdoor education
Clean combustion technologies	Packaging research, lifetime research
Cognitive vision	Pervasive & ubiquitous systems
Collaborative hormonal obesity research	Plant cell wall research
Comparative food consumption data	Plant health policy e.g. Control of non-statutory diseases
Comparative research on different political systems	Plant-life management issues for nuclear power plant
Computer games	Plasma physics - astrophysics collaboration
Continuous manufacture / flow chemistry	Power electronics for electricity networks
Control of intracellular calcium in arrhythmia	Precious metal casting
Converging technologies, micro and nano manufacturing	Presence, human-computer confluence, companions
Creative industries; design	Prion diseases
Crisis Management & Security, Software Defined Radio	Production technologies for next generation products
Customised products using additive manufacturing	Quantum dot lasers
Cyclist road safety and measures to reduce casualties.	Quantum enabled technologies
Damage to Marine vessels from bad weather	Radar Absorbent Materials (RAM) for Wind Turbines
Detectors development for future linear colliders	Railway electric traction
Dielectric Monitoring of composite materials	Revolutionary photovoltaics beyond silicon
Endemic diseases of pigs	Risk of natural hazards / multi-hazards
Ethical and social consequences of ICT	Robust low-cost ecotoxicological analysis methods
Facilities design construction and operation	Safety at sea; Noise and Health
Fisheries genetics/ biodiversity/climate change	Science to policy

Fisheries; invasive species; water framework directive	Seismic hazard and risk
Flight safety issues in upset conditions	Small scale fundamental environmental monitoring
Flow chemistry	SMART energy networks
Friction stir welding	Soil Sensing; Robotics in Agriculture
Genomics for Sustainable Animal Breeding	Space telecommunications
Global monitoring for environment and security	Strategic plant health projects at the EU level
Hardwood processing	Sustainable energy technologies
High speed flight	Synthetic characters, story-telling, affective computing
Hygienic design and operation of food processes	Telomerase/telomere research (cancer and ageing)
IGCC, boilers, combustion	Textile biotechnology
Impacts of anti-science movements & foolish legislation	The role/ importance of red meats in human diet
Infectious disease networks	Tsunami studies
Integrated activities on livestock genomics	Turbulent combustion related to gas turbine engines
Integration of optics and electronics	Ultra low CO2 steelmaking / manufacturing
Internet and the impact on pupils	Water and wastewater treatment and sustainability
Lean Thinking in Product Design and Development	Whole aircraft research topics via Airbus
Living Labs - small rural businesses	Wild biodiversity to support rural industries

In addition to asking a question about national funding gaps, the survey invited participants to specify important areas of scientific or technological activity where the UK has been weak historically, for whatever reason, and where FP investment had helped UK research groups to improve their international standing. In essence, people were invited to list any areas of national weakness that had been strengthened by FP action.

In this case, the survey attracted around 500 comments from the 1100 or so respondents, rather than the 800 comments concerning the more straightforward question about funding gaps, which split roughly in four groups:

- 50 that signalled they did not have the kind of overview to be able to comment
- 100 that simply stated there had been no such instances, sometimes associated with the qualification, in their area of expertise
- 100 that pointed to general improvements that had arisen as a result of very much easier access to opportunities for close cooperation and interaction with researchers, industrialists and others, in Europe and further afield. Within this group, was a significant minority of people that suggested the FP was better suited to inter-disciplinary research – in many very different areas of enquiry – than were national schemes and that this experience was strengthening research skills and producing insights that might otherwise have eluded people
- 250, or around 20% of all respondents, that pointed to specific areas where they considered the FP had enhanced national capabilities, a significant proportion of which linked back to contributors' earlier remarks about 'gaps in national funding.' Figure 32 presents a selection of research areas singled out by respondents as areas where they believe FP activities have strengthened previously under-developed national capabilities

Figure 32 – A random selection of research areas where respondents believe FP activities have strengthened previously weak UK capabilities

Experimental research into irradiation of materials	Food authentication, forensic provenancing, forensic method development
Flight safety, piloted simulation beyond the normal flight envelope	FPs have helped build expertise in operations with specialist research aircraft that could not have been developed in UK, or any one country, alone.
Gut microbiology and health	Funding 'high risk high reward' projects

Health related systems biology, hypothesis free research of high impact which is completely ignored in the UK.	Gene and genetic therapies; rare diseases
In vitro protein synthesis in the UK was relatively weak	High energy physics, particularly for radiotherapy
Obesity and diabetes and the impact of physical activity	High risk/high reward projects that have no immediate commercial value
Hydrogen safety	The UK remains very weak on the hygienic design of infrastructure and equipment for other areas where hygiene may be deemed critical e.g. Clinical areas.
Integrated transport planning; interoperability (e.g. of ITS, Smartcards)	Hydrogen storage and the hydrogen economy
Integrated coastal zone management	ICT systems for managing uncertainty
Integrated energy planning	Improved vaccines for bluetongue disease; development of multivalent vaccines for BTC, EHDV and AHS
Large scale structural testing as validation of assessment methods (the UK's infrastructure in the power industry has declined dramatically since privatisation).	Joint probability mapping/modelling
Lithium batteries	Lightweight twin skinned aerospace structures
Marine technology	International migration
Medium term (10 year) applications of HTS research	Molecular diagnostics
MEMS/NEMS Design of nanostructures from first principles to technological applications	Motor Cycle collisions
Model-based Design, Safety Analysis, Optimisation, Architecture Description Languages	Multimodal interaction, speech and language technologies
Modelling of organ motion	Nanosafety. Biomaterials
Nuclear Data, Nuclear Fuel cycles, Advanced reactor modelling.	Nutritional biomarker measurement for diabetes epidemiology.
Photovoltaics	Plastic optical fibre technology
Population biology and genetics of species of a commercial nature, e.g. Population biology and genetics of salmonid fish	Oceanography of enclosed seas
In the area of Solid oxide fuel cells there is considerable expertise across the EC	Shipping and maritime transport
Semantic-based systems, knowledge engineering	Research in cell death and in particular in Dependence Receptors
Solar disinfection of water	Solar-thermal energy systems
Technology-enhanced learning, robotics and cognition, human-robot interaction, affective computing	Some aspects of tissue engineering and nanotechnology
Textile biotechnology	Standardisation and improvement of nuclear medicine scan data
Cellular engineering approaches for cancer. I have been impressed with FPs in that they are often ahead of the curve in terms of funding areas with a lot of potential.	Standards for the use and quality control of digital technology for imaging breast cancer
The FP project in which I was involved addressed poverty from a philosophical perspective, but in relation to Old and New Poor Laws and the conceptualisation of poverty in literary works produced in response to these changes in law. The resulting project was genuinely inter-disciplinary - and was in dialogue with literature, philosophy and the Management School Centre for Sustainability. It crossed UK funding-body boundaries.	The FP6 Marie Curie RTN has allowed us FINALLY to tackle an important research area (breeding of a novel fodder legume with tannins for animal nutrition, health and greenhouse gas emissions). An FP7 Marie Curie IEF is similarly enabling us to get involved in a willow breeding programme for the benefit of animals and the environment.
The FPs have allowed cross-disciplinary research in biomimetics where all disciplines received funding. This is encouraged in the UK, but is always criticized by reviewers, and tends not to work out.	Surface-atmosphere exchange
The FPs have allowed us to maintain and develop skills in areas where we used to be very strong in the absence of	Synthetic Biology in the broadest sense

national funding.	
System simulation, Dynamic Modelling	The growth in accelerator physics in the UK was greatly helped by support from the EU both in financial terms and in intellectual support from international peers.
Use of space capabilities in the security domain	The production of appropriate nano-particles
Veterinary parasitology	Vaccine development
We have had the opportunity to develop our skills in avian immunology through the collaborations in FP6.	The UK's particle physics programme is now to an unhealthy extent concentrated on CERN. The fps have given some desperately needed breadth to this programme.
Wider labelling / consumer comms / global view	The UK is weak with regards to R&D underpinning organic/ecological farming systems in general, because it does fund research in this area for political reasons
Wind turbine blade materials research	There is limited funding in immunodeficiency and cancer immunology.
Work on the Digital Ecosystem topic is now being brought into the UK agenda under the Digital Economy programme	UK funders are appalling at funding interdisciplinary research (e.g. For environment and health)
Aquaculture, which has virtually no support from the UK or Scottish governments.	UK is generally weak in the areas of bio-processing and biochemical engineering, especially downstream bio-processing, and FP helped improve performance
Yes, support for Industry	Yes. Electric Vehicles, we have a strength in this area but do not have the critical mass to compete with the consortia lead by Fraunhofer (for example).
Very Long Baseline Interferometry, high-precision spacecraft tracking, low-noise amplifier development.	GaN light emitting diodes, GaN based sensors, novel nanofabrication technology are all areas where UK capability has increased considerably. This is increasingly being recognised within the UK, but we had to go to Europe to gain funding.

6.2.4 Added value associated with FP participation

Respondents were asked to elaborate the main 'added value' associated with participation in the FP. Over 1,000 responses were received from respondents, with a wide range of opportunities, benefits and outcomes put forward as particular areas of added-value.

Around half (~45%) of the comments that were provided highlighted that FP participation offered the opportunity to collaborate on a European- or international-level with other researchers, groups and organisations. Most of these respondents merely stated that it was beneficial to work with partners in other countries. However, some respondents stated that the FP expanded the pool of expertise very significantly: it provided the opportunity to collaborate with most if not all of the leaders in a given field; and the EU scope also increases opportunities for reaching a greater part of a sector's value chain or a wider range of prospective user, as compared with a national scheme. The focus within the FP on *collaboration* between leading centres rather than *competition*, more typical of the situation in the UK research base, was also highlighted as important by a small number of respondents.

A considerable number of comments (~15%) also related to the opportunity provided by FP participation for the development of personal contacts or networks amongst project partners. Individuals highlighted the important role played by networking with important / leading 'players' from industry, academia and other sectors in a field, both across Europe and internationally, opening doors to future work and signalling ability / advancing one's career. It was also suggested that it increases researchers' purview of opportunities for further business or research.

The other main areas of 'added-value' associated with FP participation that were identified (by 5%-10% of respondents in each case) can be summarised as follows:

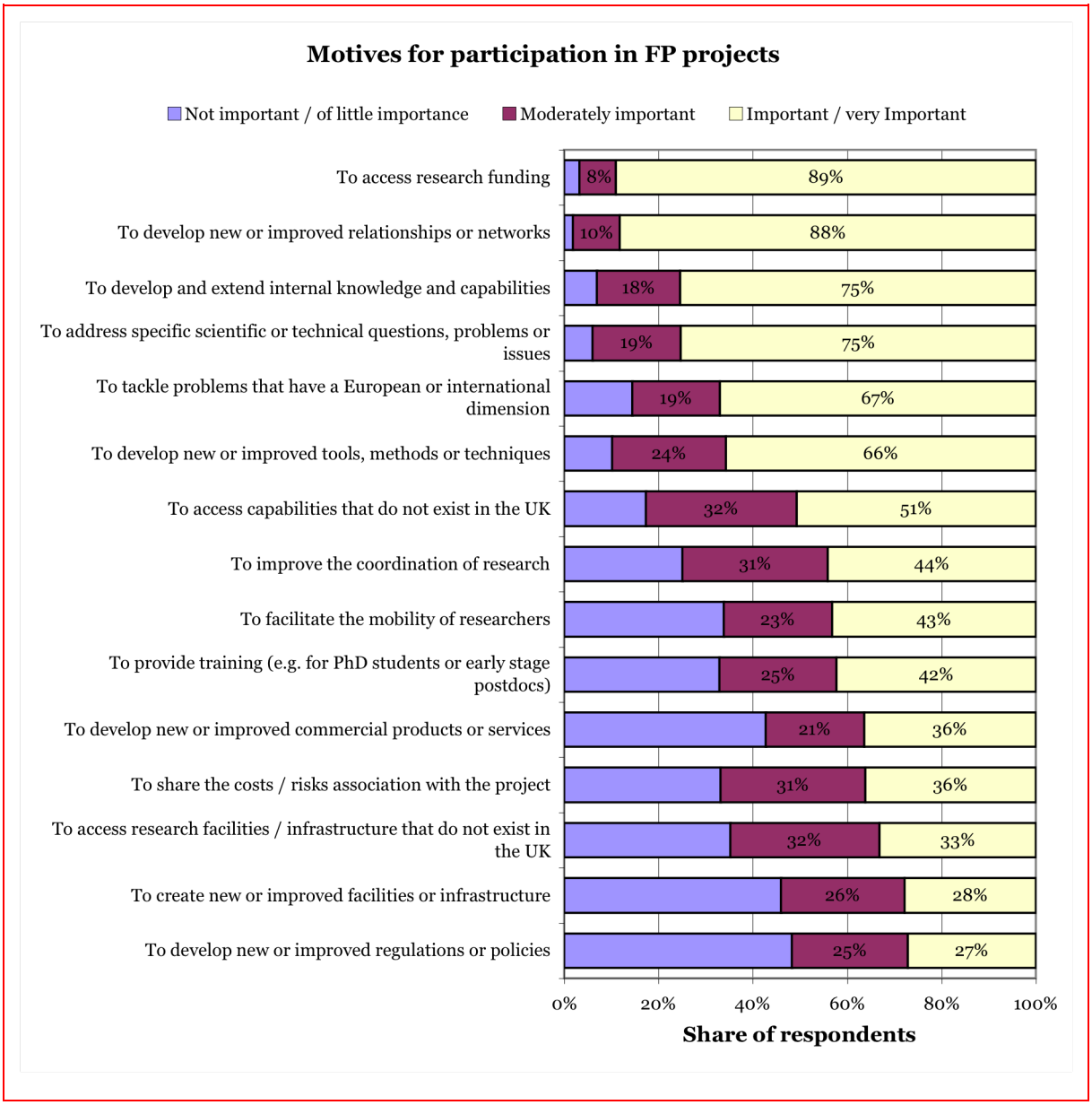
- The funding available through the FP, which can augment national funds or address gaps in funding, sometimes providing opportunities that might not otherwise be available
- The amount of funding on offer means one can achieve critical mass more readily, and make faster and better progress on challenging research questions

- The opportunities for personal advancement, including (i) the provision of training, career development and experience for junior/early career researchers, (ii) the funding available for the exchange of personnel and the mobility of researchers, and (iii) the increased ability to recruit and attract high-quality researchers and students
- The opportunities to access, establish contact with and work with industry through FP participation, both from the perspective of other industry organisations and other types of participant (HES, REC)
- The access to knowledge, expertise, skills and facilities of other FP participants that is 'new', 'different' or 'at a higher-level' and the opportunity provided for inter/multi-disciplinary approaches and collaborations
- The increased international recognition, profile and visibility of researchers, research groups and institutions that participate in the FP
- The likelihood of achieving outcomes that can be exploited, either through practical application and commercial use, or through inputs to and influence on strategic / policy issues

6.3 Drivers and motives of participation

Questionnaire respondents were asked to rate the importance of a series of factors in terms of their importance as motives for their organisation's or research group's participation in FP projects. The results are summarised in Figure 33 and show that the primary motives for participation are (i) to access research funding, (ii) to develop new or improved relationships and networks, (iii) to develop and extend internal knowledge and capabilities, and (iv) to address specific S&T questions, problems or issues. These four motives were rated as important or very important by at least three-quarters of the respondents. Tackling problems with a European or international dimension, developing new or improved tools, methods or techniques, and accessing capabilities that do not exist in the UK were also important or very important motives for a majority of respondents. These findings mirror those obtained in several other national FP evaluations, indicating that UK participants and their counterparts from other countries have similar motives as regards FP participation.

Figure 33 – Motives for participation in FP projects (n=1,143)



Technopolis survey of UK FP6/7 participants – Feb 10

Analyses of the primary motives for participation were carried out separately for the four main types of participating organisation and the results indicate that there is a high degree of alignment between the four groups. Financially dependent participants (e.g. universities, institutes) ranked access to funding as their top priority, while the financially independent participants (e.g. businesses, public bodies) ranked relationships as their primary motive. Figure 34 shows the 'top five' motives overall (in ranked order), with the first row being the most highly rated) and indicates where each was ranked (in importance) by HEIs, industry, research institute and 'other' participants. It reveals that:

- The top five motives overall were also the top five motives for HEIs and Research Institutes, reflecting the dominance of these constituents within the responses and the programme
- The top three motives overall were also the top three motives for industry participants, although their fourth and fifth most important reasons for involvement were different (namely to develop (a) new or improved commercial products or services, and (b) new or improved tools, methods or techniques)

- Four of the 'other' participants' top five motives appear in the top five list overall. These (mainly public sector) participants rated the development of new or improved tools, methods or techniques more highly than tackling specific S&T questions, problems or issues

Figure 34 – Top five motives for involvement, by organisation type (n=1,143)

Overall	HEIs	Industry	Research Institutes	Other
To access research **funding**	To access research **funding**	To develop new or improved **relationships** or networks	To access research **funding**	To develop new or improved **relationships** or networks
To develop new or improved **relationships** or networks	To develop new or improved **relationships** or networks	To develop and extend internal **knowledge** and capabilities	To develop new or improved **relationships** or networks	To develop and extend internal **knowledge** and capabilities
To develop and extend internal **knowledge** and capabilities	To address specific scientific or technical **questions**, problems or issues	To access research **funding**	To develop and extend internal **knowledge** and capabilities	To access research **funding**
To address specific scientific or technical **questions**, problems or issues	To develop and extend internal **knowledge** and capabilities	To develop new or improved commercial **products or services**	To tackle problems that have a **European** or international dimension	To tackle problems that have a **European** or international dimension
To tackle problems that have a **European** or international dimension	To tackle problems that have a **European** or international dimension	To develop new or improved **tools**, methods or techniques	To address specific scientific or technical **questions**, problems or issues	To develop new or improved **tools**, methods or techniques

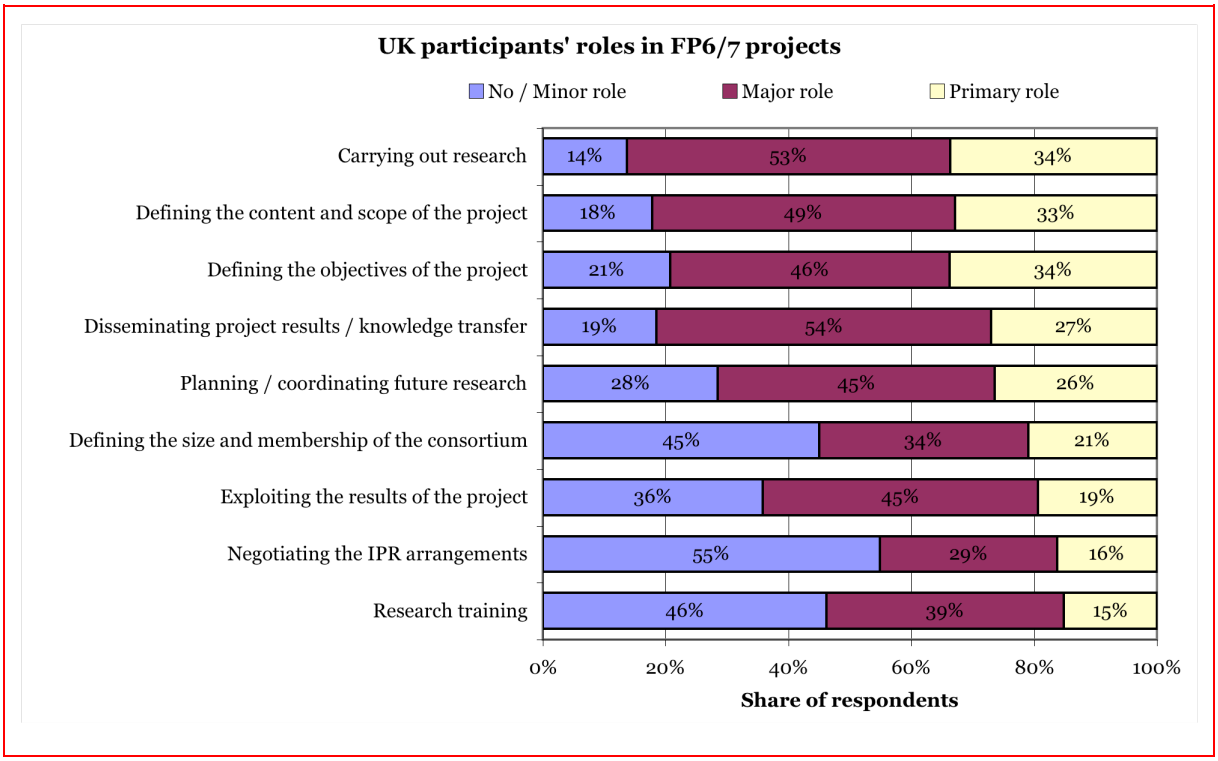
Technopolis survey of UK FP6/7 participants – Feb 10

6.4 UK participants' roles in the projects

The questionnaire sought to determine the extent to which UK participants have played various different roles in projects. The results obtained suggest that UK participants play full and active roles in all aspects of project conception, delivery and exploitation. The results are presented in Figure 35 and show that:

- Over three-quarters of the UK participants have played a major or primary role in defining the content, scope and objectives of the project and in carrying out the research. Over a third of the participants stated that they had played a primary role in these two key aspects (definition, delivery) and roughly one half had played a major role in this regard
- UK participants have also in most cases (81%) played a major or primary role in knowledge transfer activities and in disseminating the project results. However, only around a quarter (27%) considered that they had taken a primary role with regard to this
- A majority of UK participants has played a major or primary role in relation to defining the consortium, researcher training, exploiting the results and in planning future research
- The only aspect where a majority of UK participants did not play a major or primary role was in negotiating the IPR arrangements

Figure 35 – Role of UK participants in FP6/7 projects (n=1,038)



Technopolis survey of UK FP6/7 participants – Feb 10

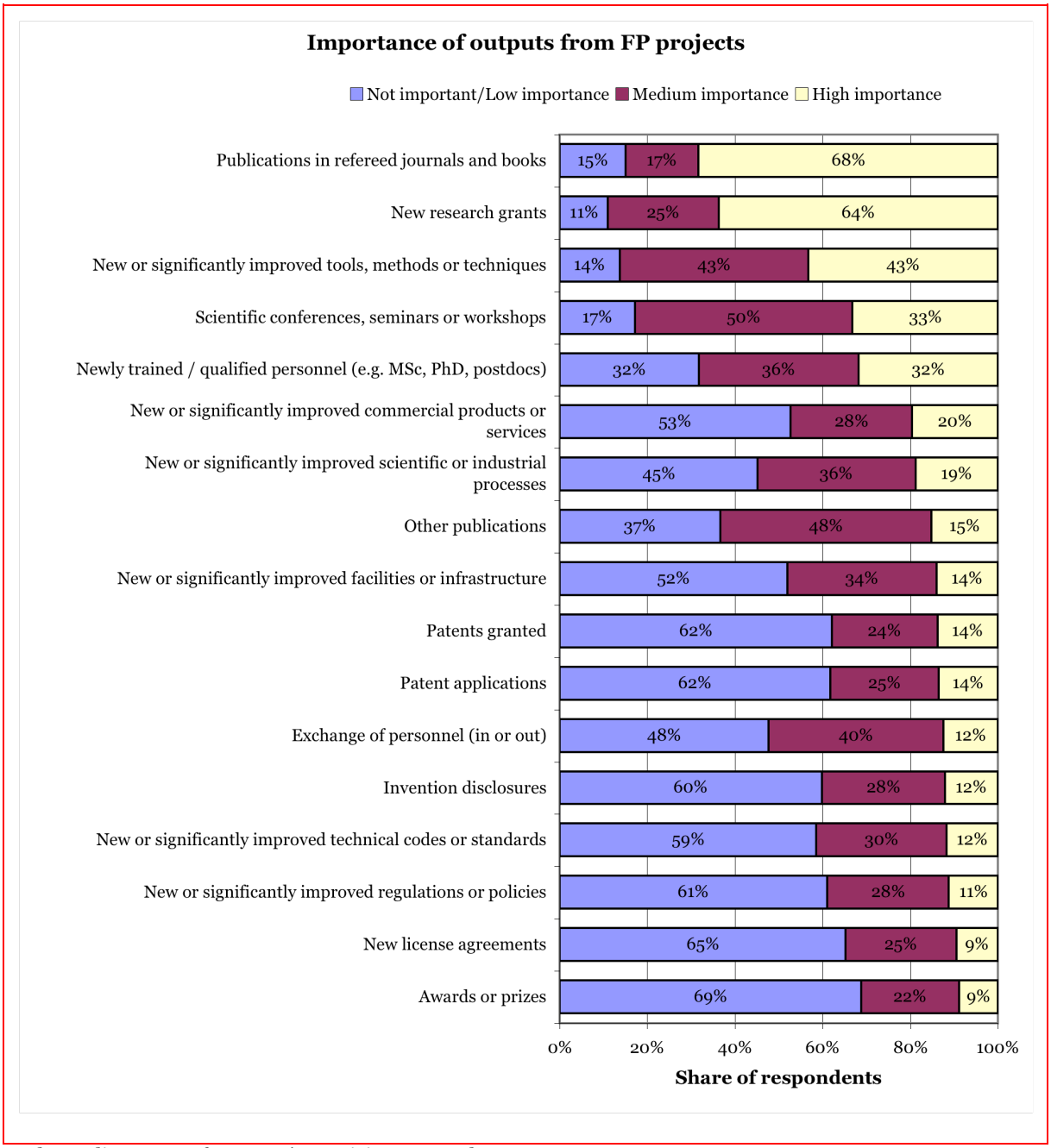
6.5 Outputs sought and delivered through FP projects

6.5.1 Importance of different types of outputs to project participants

Questionnaire respondents were asked about the importance of various different types of outputs from their FP projects. The results are summarised in Figure 36 and indicate that the most important outputs are (i) publications in refereed journals and books; (ii) follow-on research grants; (iii) new or improved tools, methods or techniques; (iv) scientific conferences, seminars and workshops; and (v) newly trained or qualified personnel. These were rated as of medium-high importance by at least two-thirds of the respondents and as of high importance by at least a third.

The least important outputs were (i) awards and prizes; (ii) new license agreements; (iii) new or significantly improved regulations or policies; (iv) new or significantly improved technical codes or standards; and (v) invention disclosures. These were rated as of high importance by only around 10% of the participants and were of medium-high importance to only around two in every five participants.

Figure 36 – Importance of FP project outputs to participants (n=1,130)



Technopolis survey of UK FP6/7 participants – Feb 10

Analysis of the different responses provided by the four main groups of participant revealed that three of the top-five outputs overall also figure within the top five most important outputs for each individual group. These were (i) new research grants, (ii) scientific conferences, seminars or workshops and (iii) new or significantly improved tools, methods or techniques. Newly trained personnel were rated as a top-5 output by HEI participants, but not by the other three groups. Industry participants rated (i) new or significantly improved scientific or industrial processes, and (ii) new or significantly improved commercial products or services within their top five outputs, however these were much less important deliverables for the other types of participants. Figure 37 shows the top five outputs overall and for each of the four main groups of participant.

Figure 37 – Top five most important outputs, by organisation type (n=1,143)

Overall	HEIs	Industry	Research Institutes	Other
New research **grants**	Publications in refereed **journals** and books	New or significantly improved **tools**, methods or techniques	New research **grants**	New or significantly improved **tools**, methods or techniques
Publications in refereed **journals** and books	New research **grants**	New or significantly improved commercial **products or services**	Publications in refereed **journals** and books	Scientific **conferences**, seminars or workshops
New or significantly improved **tools**, methods or techniques	Scientific **conferences**, seminars or workshops	New or significantly improved scientific or industrial **processes**	New or significantly improved **tools**, methods or techniques	Publications in refereed **journals** and books
Scientific **conferences**, seminars or workshops	Newly trained / qualified **personnel**	New research **grants**	Scientific **conferences**, seminars or workshops	New research **grants**
Newly trained / qualified **personnel**	New or significantly improved **tools**, methods or techniques	Scientific **conferences**, seminars or workshops	Other **publications**	Other **publications**

Technopolis survey of UK FP6/7 participants – Feb 10

6.5.2 Extent to which outputs were delivered in line with expectations

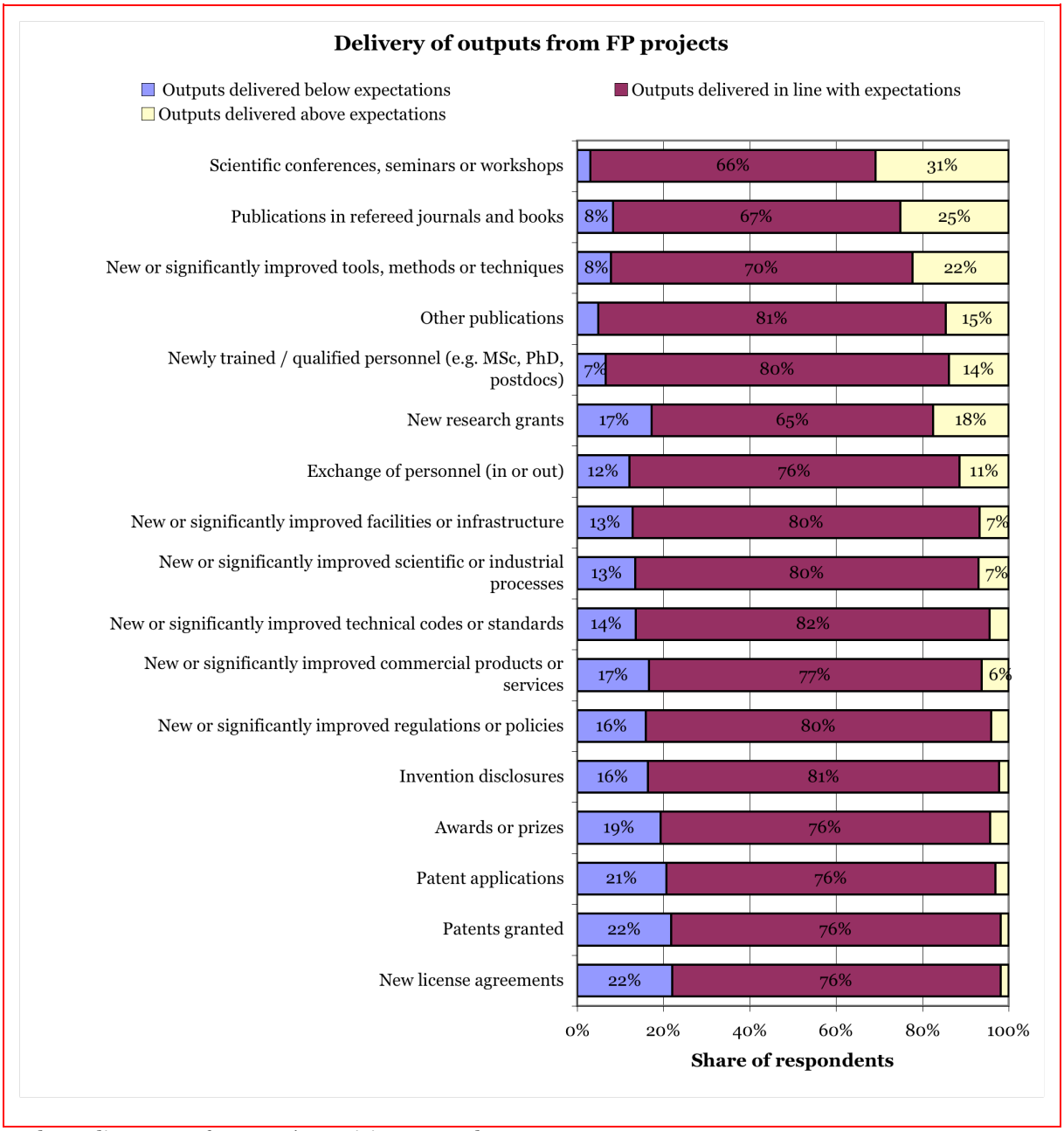
Questionnaire respondents were asked about the extent to which the outputs realised were below, in line with, or above expectations. The results are summarised in Figure 38 and show that at an overall level the vast majority of participants feel that their projects have delivered each of the given classes of output (where relevant) in line with expectations. In fact just over three-quarters of the ratings received (76%) suggest that outputs matched expectations. It should be noted, however, that marginally more participants assigned 'below' expectation ratings (13%) in more cases than they assigned 'above' expectations ratings (11%).

Looking at Figure 38 in more detail reveals that the more 'academic' outputs (conferences, publications, trained personnel, follow-on research grants, etc.) are more likely to be delivered at levels above expectations, while the more commercially oriented outputs (e.g. licence agreements, patents, invention disclosures, etc.) are more likely to be delivered at levels below expectations. This might be expected given the pre-competitive focus of the research carried out in FP projects, and the more uncertain and contingent nature of a patent as compared with a publication. Analyses of the ratio of outputs delivered above and below expectations for each category of participant reveal the following:

- For HEIs there was a 50:50 split between outputs delivered above and below expectations
- For Industry participants there was a 33:67 split between outputs delivered above and below expectations
- For Research Institutes there was a 57:43 split between outputs delivered above and below expectations
- For Others there was also a 57:43 split between outputs delivered above and below expectations

This shows that industry participants are most likely out of the four groups to state that outputs have been delivered below expectations. However, despite this, it is still the case that outputs have been delivered in line with or above the expectations of industry participants in 83% of cases.

Figure 38 – Delivery of FP project outputs (n=1,130)



Technopolis survey of UK FP6/7 participants – Feb 10

A more detailed analysis of the extent to which important outputs had been realised through FP projects revealed that:

- Outputs rated as of high importance were more than twice as likely to be delivered at levels above expectations than below
- Outputs rated as of no / low importance were more than eight times more likely to be delivered at levels below expectations than above

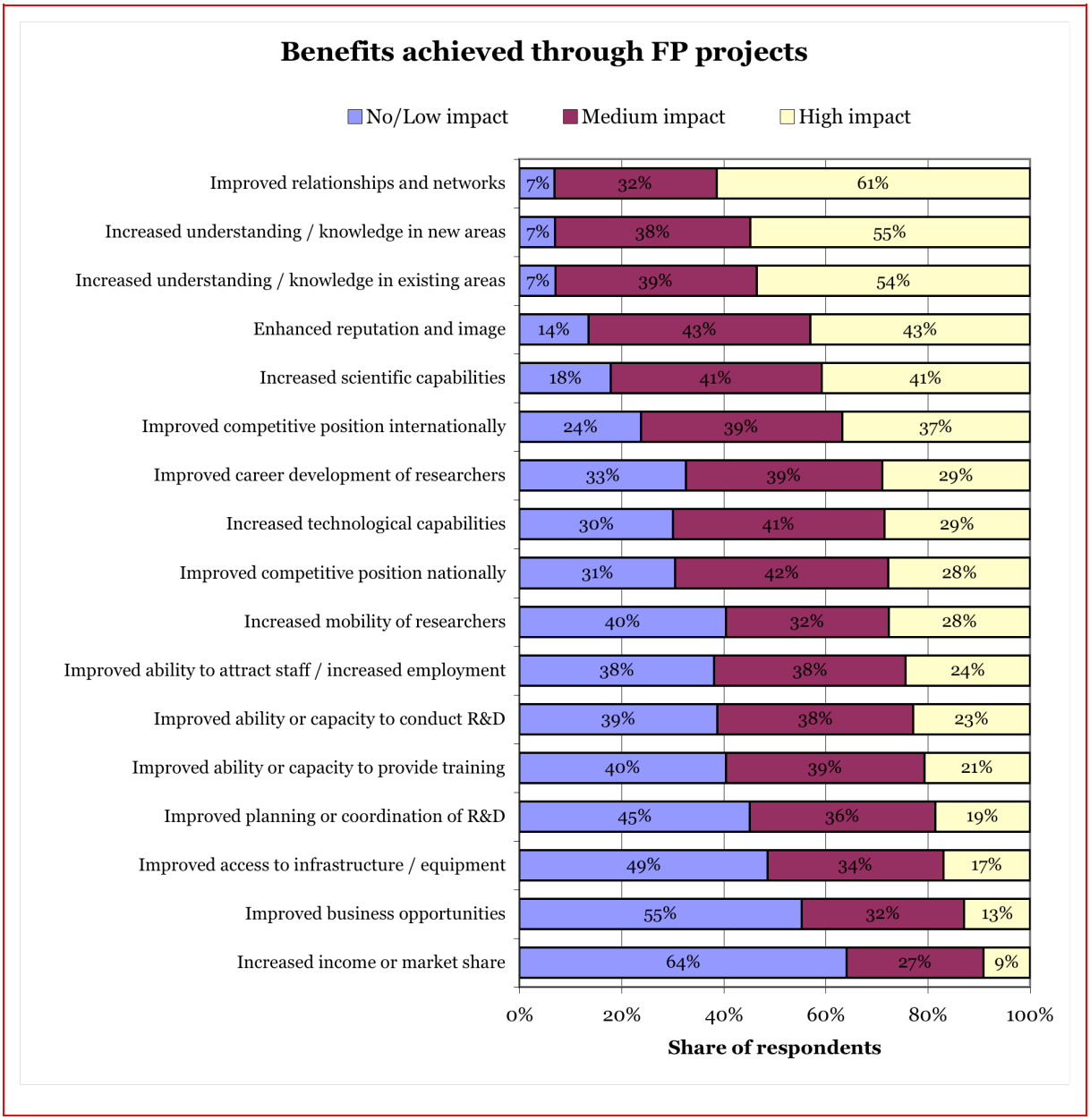
These findings suggest that important outputs are prioritised by participants, as one might expect, and this conscious / purposeful focus makes it very much more likely that targeted outputs are realised as compared with less important or unexpected outputs.

6.6 Benefits delivered through FP projects

Respondents were then asked about the benefits realised as a result of these many and various classes of project output. The results are shown in Figure 39 and confirm that a majority of respondents had realised medium-high impacts in all but two of the predefined classes of programme benefits. Only in the cases of (i) improved business opportunities and (ii) increased income or market share did a majority of participants state that there were no / low impacts for their organisation or research group.

The areas of highest positive impact were in relation to (i) improved relationships and networks, (ii) increased understanding / knowledge in new *and* existing areas, (iii) enhanced reputation and image, and (iv) increased scientific capabilities. For each of these types of benefit at least 40% of participants reported high impacts and at least 80% reported medium-high impacts.

Figure 39 – Benefits achieved or realised through FP projects (n=1,130)



Technopolis survey of UK FP6/7 participants – Feb 10

An analysis of the differences in the ratings of benefits provided by the four main groups of participant revealed few differences between them. All four groups rated (i) improved relationships and networks, (ii) increased understanding / knowledge in *new* areas, (iii) increased understanding / knowledge in *existing* areas, and (iv) enhanced reputation and image within their top five benefits. Three of the four groups also included increased scientific capabilities as a top-five benefit, the exception being industry participants, who rated improved business opportunities within their top five.

Respondents were asked what advice they would give to other UK participants on **how to maximise the benefits** that they derive from FP projects. Over 600 respondents provided suggestions, which can be summarised as follows:

- **Participate in appropriate areas** – It is important that participants build on their existing expertise and participate in areas that are: (i) of central interest to their organisation / group, (ii) complementary to their other activities, and (iii) aligned with their wider strategic goals and objectives. Potential participants should understand a project fully before committing, be clear at the outset on the desired and potential benefits to them of involvement and have a strategy for using the project results / outcomes
- **Establish a good consortium of partners** – The selection of partners involved in a project will make a significant difference to the smooth running of the project, the results achieved and the potential benefit that can be gained through involvement. As such, partners should be chosen carefully, ensuring that they are reliable and of 'high quality', can contribute effectively and efficiently, can work to deadlines, and can add real value through their involvement. There should be a balance of organisations within the consortium, which should preferably include partners that between them cover some or all of the following requirements: already known and trusted; experienced with FP projects; have in-house project management/administrative capabilities; offer expertise and resources that will be of benefit to you; have dissemination / exploitation expertise; are end-users/beneficiaries; are not 'tokenistic'
- **Be organised and plan thoroughly** – It is important to ensure a strong organisational focus from the outset, with careful planning of work, milestones, outcomes, dissemination routes, etc. and to maintain focus on these elements throughout the life of the project. The project should be focused and have clear targets and objectives, with sufficient time, budget and other necessary resources allocated to achieve these
- **Be realistic** – The project proposal should not 'over-promise' or try to meet the needs of funders at the expense of the needs of participants. When planning projects it is important to be realistic about the size, scope and expected outcomes relative to the requested budget and to ensure that there are clearly defined, tangible and realisable goals and objectives. It is also important that partners can perform the required / promised tasks to a high standard, on time and within budget. At the same time participants should not expect 'quick wins'. Nor should they expect to receive significant benefits without first putting in significant effort
- **Ensure sufficient attention is paid to administrative elements** – Participants should become well aware of the administrative rules and procedures and the financial and other reporting requirements in advance and not be put off by what at first appears to be an overly bureaucratic burden. Participants should expect and prepare for administrative elements of projects and seek to minimise these as much as possible, through (if possible) a qualified, experienced and dedicated individual or unit that can keep the administrative burden on the scientific/research team to a minimum
- **Take on responsibilities within the consortium** – To maximise benefits and influence, consider the appropriateness of taking on certain responsibilities for relevant areas of a project (i.e. work packages) or [less commonly suggested] for the whole project (i.e. as a coordinator) if this is possible and the project aligns with your interests
- **Communicate and collaborate effectively** – Communication within consortiums is essential and FP project partners should seek to work in a truly collaborative fashion. Sufficient time should be allocated before and during projects to developing the collaborative network, building trust and to maintaining regular contact and interaction. The consortium should ensure that all partners are engaged and making full use of the opportunities to share knowledge, and that participants are not working in isolation

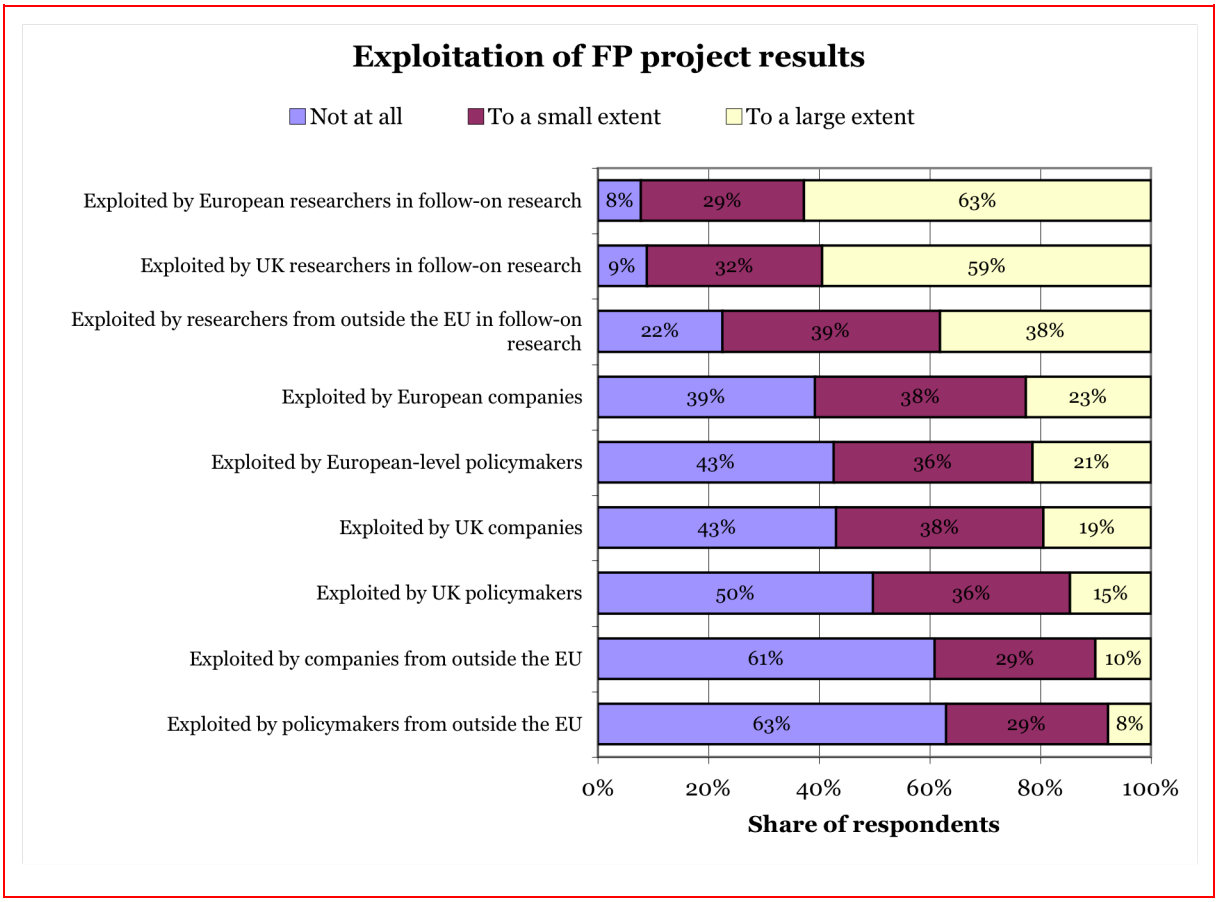
- **Be active and maintain communication** – It is important to be active within the consortium throughout the project and to participate fully in all its elements (attending workshops / meetings, maintaining close communication, etc.). Participants should proactively seek involvement and opportunities, develop relationships with other project members, put forward ideas and seek to share knowledge (people and ideas) at every opportunity
- Don't forget to **exploit results** – Project participants should ensure that desired outcomes and impacts are understood from the start, that end-users and beneficiaries are known, and that (potentially) the relevant individuals and organisations are involved in the project. The dissemination and exploitation of results should be built into project planning and members of the consortium should include individuals with expertise and experience in these areas. Information on the project and its results should be promoted and disseminated widely from an early stage (domestically, with colleagues, collaborators, end-users, policy-makers and other potentially interested parties) and the research and results should be of a high quality, with publications peer reviewed. On a related point, participants should also seek to build on new partnerships formed and search out follow-on opportunities from the project

6.7 Exploitation of FP project results

Survey respondents were asked about the extent to which they expected their FP project results to be exploited by researchers, companies or policy makers at national, European or International levels.

The results are summarised in Figure 40 and show that a majority of respondents expect substantial wider exploitation to occur only in the case of spillovers to other UK and European *researchers*, who are expected to exploit projects to a large extent. UK and EU companies and UK and EU policymakers are expected to exploit project results in half or more of the cases, but only to a small extent. Overall, around 20% of all respondents believed their FP work has, or will, had a large impact on business or policy at the European level. There was a 3-step decline in the proportion of respondents attributing substantial impacts to their FP projects, as one progresses along the geographical chain, from Europe an-level benefits, to UK benefits to benefits to parties beyond Europe.

Figure 40 – Exploitation of FP project results (n=1,131)



Technopolis survey of UK FP6/7 participants – Feb 10

The questionnaire invited people to give concrete examples where their FP project results had influenced policy, and some 300 of the 1,100 or so respondents provided a comment, which suggests that 20-30% of participants might be expected to produce results of relevance to policy teams. This group breaks down into several distinct segments, specifically:

- Around 100 respondents stated that their project was still in progress and that while they expected there to be benefits for policy makers, this was yet to happen
- Around 50 respondents stated that there had been no policy impact and that they did not expect there would be any. A minority took the opportunity to decry the quality of the relationship between policy leads and the research community, bemoaning the gap between the two groups and otherwise citing instances where research results were not acted upon as a result of more important factors
- Around 30 respondents cited academic benefits, rather than policy impacts. Those benefits ranged from informing new medical research protocols, to helping to specify future research agendas to securing follow-on funding to defining good practice advice for organising and managing international projects
- Around 20 respondents cited commercial benefits, rather than policy impacts, primarily new tools and methodologies and standards (e.g. MIMIC data mining tool purchased by IBM)
- Around 100 respondents cited contributions to specific policy or regulatory frameworks, including data / methodologies being cited in Commission and other policy papers or more directly underpinning specific directives and associated European or International Standards. Figure 41 presents a list of around 50 examples to illustrate the kinds of contribution being pointed to by respondents.

Figure 41 – Selected examples of FP contributions to policies and regulations

Biosapiens led to development of improvements to DAS standard + implementation. Following this, DAS has been widely adopted at the Wellcome Trust Genome Campus and for other international projects, such as with the NIH.
City of Rome policy for managing extra-community migrants.
Clean-ERD project had direct impact on stage IIIB of the EU directive for railway diesel emission regulations.
Contributions to risk assessment for campylobacter control in poultry
Country of Origin labelling for food products
Developed models for building in organised crime risks into EC policy
Development and implementation of Council regulation 812/2004 on cetacean by-catch, driven largely by work conducted here under national and FP6 (and later FP7) projects.
Draft EU regulation on hydrogen powered vehicles
EuroFIR data has fed into regulation on nutrition and health claims, specifically in development of a nutrient profile
European standard EN 13906, all parts has been shown to require correction and improvement
Evidence underpinning coexistence policies being developed by DG Env and DG Sanco for GM crops
Fed into two Warwick commission reports on (a) the WTO and (b) global finance
Genetic data on salmon fisheries have provided information that contributed to closure of some drift-net fisheries.
Have been informing EU policy on A better functioning food supply chain in Europe. Have been informing EU policy on the possible certification of food from mountain areas. Some of our findings are reflected in the developing Food and Drink Policy for Scotland.
Influence on development of consumer testing of vehicles to quantify their injury causation potential during impacts with pedestrians and cyclists (hopefully leading on to the development of improved regulatory standards).
Influenced international web accessibility standards which are then pointed to by UK law/policy
Influenced the EU decision to ban the battery cages for laying hens (from 2012)
Information on greenhouse gas emissions from degraded tropical peatlands have been used in a wide variety of policy documents, e.g. in Indonesia, the UK and the EU.
More detailed land-surface modelling and results have helped inform Hadley Centre advice on future European and global land carbon budgets.
NANOSAFE 2 included a lot of agencies and had very good links to policymakers - this will have an influence - to what extent I am not sure though.
Nanotoxicology and the REACH regulation
Nations and Regions use our results (European Intelligent Transport System Architecture) to plan their future integrated road transport systems.
OECD Guidelines for Quality Assurance in Molecular Genetic Testing 2007
Our results have been quoted extensively in policy documents on transport policy, particularly regarding pricing, and the authors of these documents often consult us directly
Paper on EU hedge funds regulation has been used as a case study to prepare a report for the House of Commons on the Conservative's proposal to establish a City minister to be based in Brussels.
Regulation of clinical gene transfer and related GMP and GCP standards
Regulatory QSAR models are now an accepted tool as an alternative to animal testing
Development of policy and standards for organic farming
Results from SAFEFOODS and NOFORISK assisting in the EFSA policy formulation regarding GM food safety
Results have been used for a guidance document on operability and risk assessment of plant.
Results have fed directly into ICES working group procedures and reports, and used to formulate ICES WG policy.
Results have fed into EuroNCAP
Results have fed into forest management policy in S America and also at district level in E Africa
STAIRRS (FP5) and Silence (FP6) directly informed Environmental Noise Directive and railway TSI processes
Standardisation e.g. labelling of nano-products

The outcome of the SLipSTD project has been presented as a draft standard as a new method for assessing slip resistance of floors in CEN/TC67 and ISO/TC
The outputs from the EuroPrevall project are proving of importance in developing allergen management practices
The research was commissioned to support the Environmental Liability Directive so the reports were read by Competent Authorities of Member States and influenced the transposition and implementation of the Directive
The results of my research may change medical care in the future, but at the current state it is first proof of principle research but not yet applicable to medical care.
UK government institutions are starting to see economic and social capital in conservation through use of biodiversity and ecosystem services. The projects have strongly influenced content and initiation of two charters from Council of Europe. A private foundation is being established to exploit the results.
Underpinned Council regulation 708/2007
WFD classification of temporary Mediterranean rivers
Work on bioenergy crops is contributing to the development of a sustainability framework for deployment. Work on elevated carbon dioxide and forest ecosystems contributed to IPCC
Work on microbial contamination of dental unit water systems led to countries developing water quality guidelines.
Work on recycling waste in construction is enabling the tightening of landfill directives and reducing waste.

6.8 The balance of costs and benefits associated with FP projects

Respondents were asked about the overall balance of costs and benefits associated with their participation in FP6 and FP7 projects. The results are summarised in Figure 42 and indicate that:

- 83% of participants reported that the benefits outweighed the costs, with most of these reporting a strongly positive benefit:cost ratio
- 9% of participants reported that the benefits equalled the costs (i.e. no net benefit or cost)
- 8% of participants reported that the costs of participation had outweighed the benefits

At an overall level these findings show a very positive outcome, with the survey suggesting that a greater proportion of UK participants realise benefits that outweigh the costs than was the case for participants in FP4/5 (where an identical question revealed that 70% of survey respondents believed their benefits outweighed their costs). It is also higher than, for example, the equivalent figure obtained from Danish participants in FP6/7, which was part of a recent study carried out by Technopolis (67%).

Figure 42 – Costs and benefits of FP participation (n=1,084)

Costs outweigh benefits (-3)	(-2)	(-1)	Benefits equal costs (0)	(+1)	(+2)	Benefits outweigh costs (+3)
3%	1%	4%	9%	18%	33%	33%

Technopolis survey of UK FP6/7 participants – Feb 10

The responses provided by the four main groups of participant were analysed separately and it was found that HEI respondents had the most positive outcomes overall (87% reporting that the benefits outweighed the costs) while industry participants had the least (73% reporting that the benefits outweighed the costs. A breakdown of the responses obtained is shown in Figure 43.

Figure 43 – Costs and benefits of participation, by organisation type (n=1,084)

	Costs outweighed benefits (-ve)	Benefits equalled costs	Benefits outweighed costs (+ve)
HEIs	6%	7%	87%
Research Institutes	5%	12%	83%
Other	11%	11%	78%
Industry	16%	11%	73%

Technopolis survey of UK FP6/7 participants – Feb 10

Respondents were asked to explain their judgement on the balance of costs and benefits. Taken together, respondents reporting a **negative benefit to cost ratio** cited a long list of problems with programme or project administration, tending to increase costs, and or problems with project execution and results, tending to reduce benefits:

- **Administration** – The overall level of bureaucracy was considered excessive, requiring a lot of time and effort on the part of all participants and a disproportionate burden on smaller organisations and people new to the programme
- **Funding rules** – Universities struggle with the funding rules, and in particular the adequacy of the recovery rates allowed, when looked at in the context of national requirements on FEC. Co-financing is fine in principle, however the level of assistance seems too low given the extent to which the Commission services look to prescribe project activity and outputs. Elsewhere, the cost of meeting EC administrative requirements were considered to far outweigh the funding available to cover such overheads, while specific aspects of EC funding rules were also highlighted as being overly-restrictive and difficult to access, with insufficient levels of co-funding available
- **Timeliness** – The programme tends to move forward very slowly, and uncertainly, which creates waste and opportunity costs. Respondents complained about the timeliness of every step in the process from the call to the evaluation to contracting, to invoicing and payment
- **Project management** – Several respondents suggested that their project had been poorly managed, and that this had been manifest in poor communication and inconsistent or otherwise imperfect execution of tasks and missed opportunities for intra-project learning, knowledge exchange and synergy. In several cases, the partnership had all but broken down during their project, which had negative implications for the research results (quality) and the benefits (value)
- **Benefits** – In several cases, there was felt to have been a lack of benefits realised from the scientific outputs of projects, due to 'issues' within the consortium or 'failures' in the research

Aggregating the comments from those respondents reporting a **positive benefit to cost ratio** produced the following list, many of which were non-financial:

- The additional **employment and training** opportunities created, particularly in relation to attracting and funding high quality scientists and motivated early-stage researchers
- Direct **financial benefit** from FP funding, where the EC contribution was considered adequate / high relative to costs and where FP money provides core funding for research units / groups, supporting their existence and maintaining levels of activity
- **Funding** for the expansion, development and continuation of existing work or to fund research that would not have been possible otherwise through national funding or internal resources, due to insufficient (or non-existent) funding and / or priority in the area
- Enabling **critical mass**, in terms of funding and / or partners
- Opportunities within projects for new or enhanced (European) contacts, partners and **collaborations**
- Improvements to internal **knowledge**, expertise and skills of participants, developed through project work and through access to other participants
- **Direct outputs** from research, including publications, new tools, methods and techniques, good science and research and new facilities
- Benefits from commercialisation and **exploitation** of results (e.g. increased sales, productivity, new markets and competitiveness)
- Maintained / increased European **profile**, reputation and prestige
- New opportunities for **further research / funding**, building on the FP project and / or the collaborative links, networks and prestige created

6.9 Collaboration within FP projects

Figure 39 above revealed that the major benefit associated with FP participation is the formation of new relationships and networks. The questionnaire survey sought additional feedback from

participants concerning the number of new partnerships formed through the FPs and their impact on university-business collaboration.

As revealed in earlier sections, participants rate the development of new or improved relationships and networks as one of the main drivers for participation in the Framework Programme, and also the major area of benefit. Respondents were therefore asked about the average number of partners in their FP6/7 project(s), the proportion of these that were new (i.e. no previous collaboration), and the proportion of these *new* partners that the respondent expected to work with again in the future.

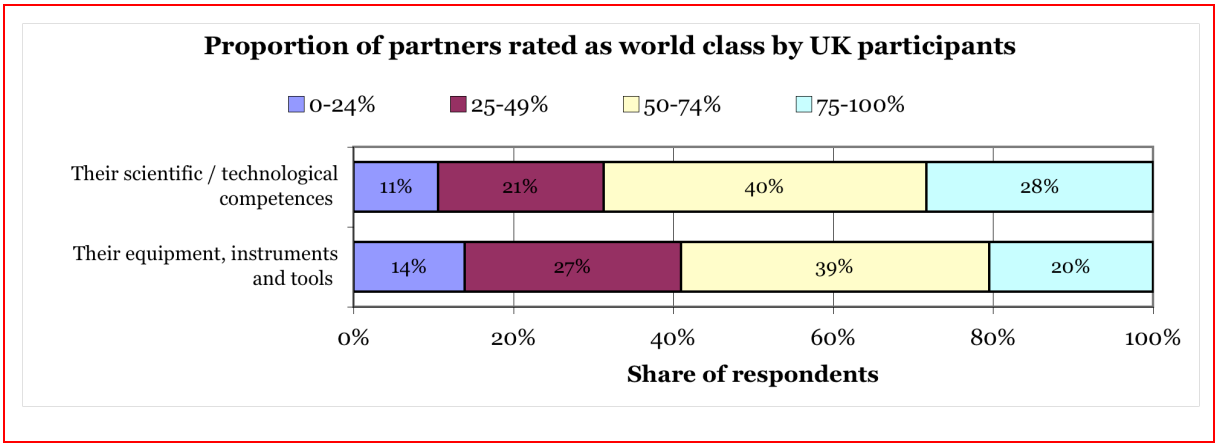
Overall, the results obtained indicate that the average number of partners in FP6/7 projects with UK participation was 12.6 (as given by respondents). On average, respondents reported that 58% of their partners were 'new' (i.e. they had not previously collaborated), which equates to a figure of 7.3 new partners per project on average. On average, respondents also reported that they expected to work again in the future with 52% of their *new* partners, which equates to a figure of 3.8 partners per project on average.

If we apply these average responses to the 45,032 non-UK participations in the UK's FP6 projects, this would suggest the FP6 projects brought UK partners into contact with approximately 26,000 *new* partners and that the number of *new, enduring* partnerships formed through FP6 was more than 13,400.

Survey respondents were asked about the extent to which their FP project partners might be considered world class in relation to (i) their scientific and technological competences, and (ii) their equipment, instruments and tools. The results are shown in Figure 44 and reveal that most UK participants consider a majority of their partners (50%+) to be world class on each dimension: 68% stated that a majority of their partners was world class in terms of their S&T competences; while 59% rated a majority of their partners as world class in terms of their equipment, instruments and tools.

HEIs on the whole provided slightly higher ratings to their partners on both measures than did industry, research institutes and 'others'.

Figure 44 – Share of partners considered to be 'world class' by UK participants (n=982)

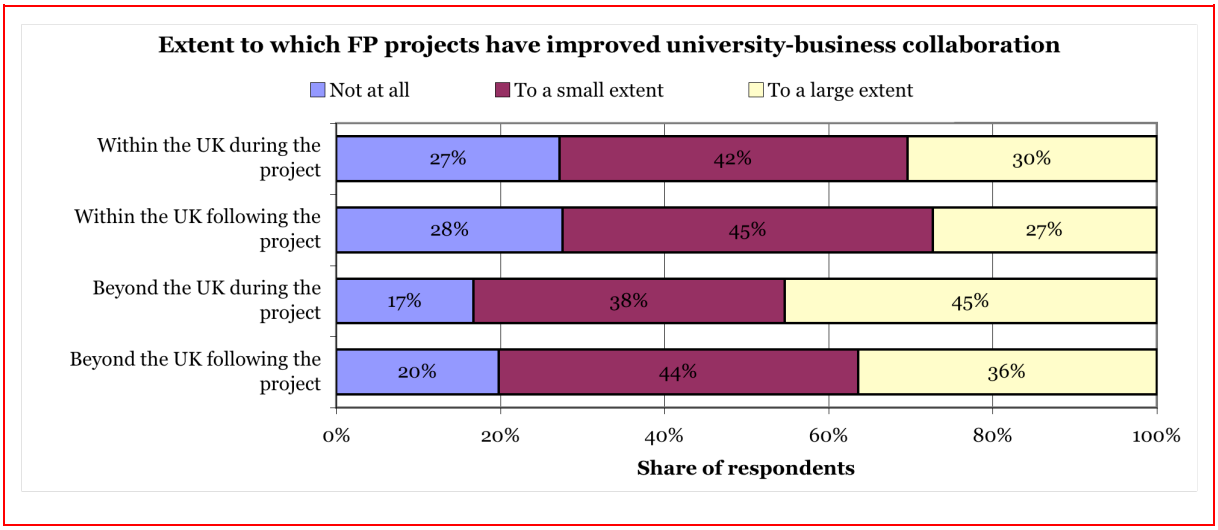


Technopolis survey of UK FP6/7 participants – Feb 10

Survey respondents were asked to indicate the extent to which FP projects have improved university-business collaboration and interaction, over and above what might have prevailed otherwise. The results obtained from UK participants are shown in Figure 45 and reveal that:

- Almost three quarters of respondents (72-73%) believe that FP projects have improved university-business collaboration *within the UK* to at least a small extent, both during and after the projects. Just over a quarter believe that FP projects have improved collaboration to a *large* extent
- A higher proportion of respondents (80-83%) believe that FP projects have made a unique contribution to improving university-business collaboration *beyond* the UK, albeit more so within projects than subsequently (distance can make it harder to sustain relationships)

Figure 45 – Extent to which FP projects have improved university-business collaboration (n=1,000)



Technopolis survey of UK FP6/7 participants – Feb 10

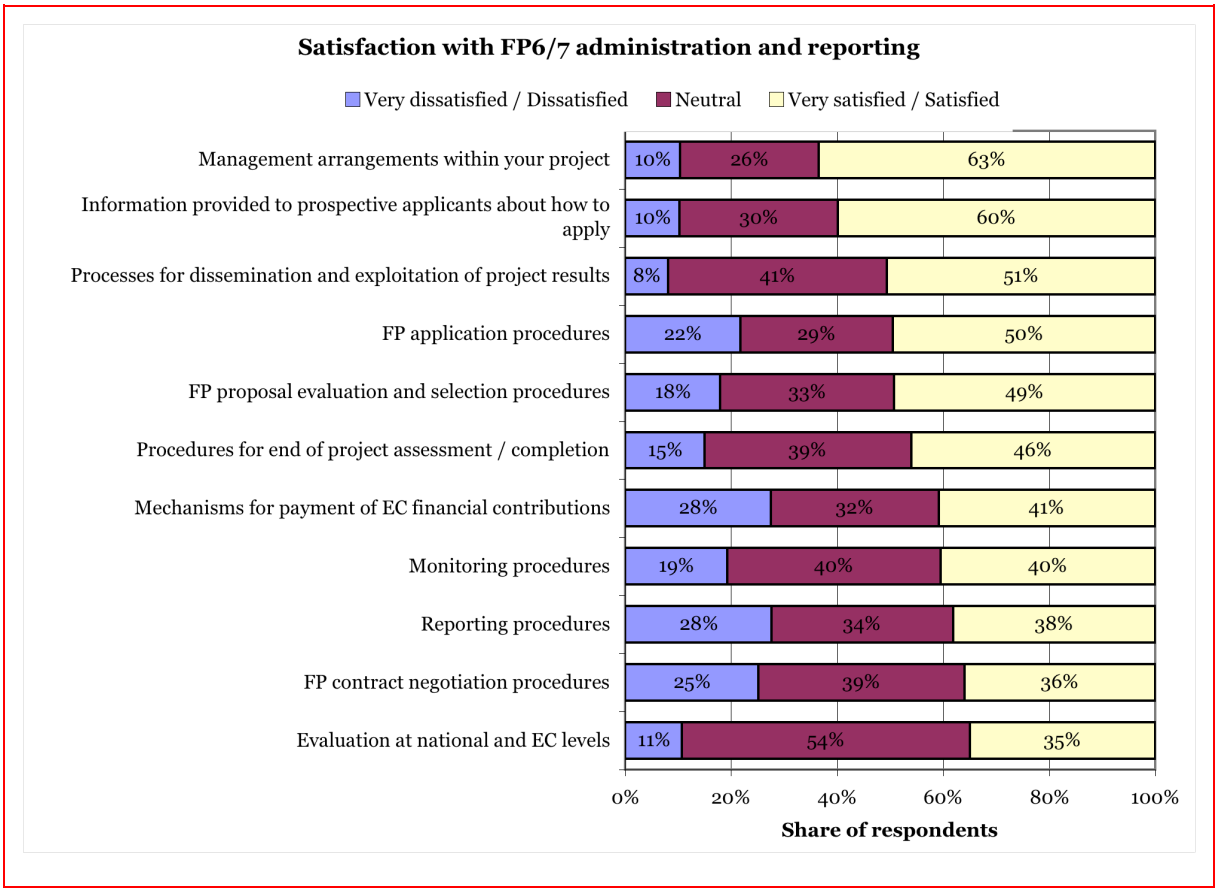
6.10 Feedback on FP6/7 administration and reporting

Participants were asked to indicate their level of satisfaction with various aspects of FP6/7 administration and reporting. The results obtained are presented in Figure 46 and reveal that in most regards a substantial majority of respondents (70%+) is satisfied or neutral with regard to FP6/7 the predefined procedures.

The areas where the arrangements have attracted the highest share of satisfied or very satisfied ratings relate to management arrangements within the projects and information provided by the Commission as to how to bid into the FP.

The areas where participants where most dissatisfied related to the reporting procedures and mechanisms for payment of EC financial contributions to the project participants, with over a quarter of respondents stating that they were unhappy in some way. The application and contract negotiation procedures were also sources of dissatisfaction for a significant minority (22% - 25%).

Figure 46 – Participants' satisfaction with FP6/7 administration and reporting (n=1,038)



Technopolis survey of UK FP6/7 participants – Feb 10

Respondents were asked to provide any comments they had on the EC's administrative mechanisms and reporting procedures, and also whether they had any specific recommendations for how processes could be improved. Over 500 comments were provided covering the full range of processes and procedures. The comments suggest that a small number (~5%) of respondents appear to be largely content with current FP administrative mechanisms and procedures, having experienced few problems and seeing the current requirements and processes as appropriate and necessary when spending tax-payers money (indeed a few respondents suggested that UK funders could learn from the systems developed by the Framework Programme). The majority of respondents, however, provided negative feedback. Most of these respondents focused on explaining issues that they had experienced through their participation in proposals and projects, rather than providing actual 'recommendations' for improvement (beyond suggestions that the situation within a particular area should be 'improved').

It is clear that experiences vary considerably, but there is some suggestion from the responses given that participants without experience of FP involvement and / or those not affiliated to large organisations with dedicated support personnel are often those encountering the most serious difficulties. Many participants noted that the availability of expert support staff within their organisation, to deal with administrative, legal and financial aspects of FP involvement, could dramatically lessen the burden on individual participants.

Many of the comments provided by respondents were brief and of a 'general' nature, stating merely that the management and administration involved in FP participation is **too complex, bureaucratic** or **slow** and that it is a waste of time and resources that should instead be devoted to the research. Other, more specific, comments and feedback focused on the following areas:

> **The proposal and application process** – proposal requirements are considered lengthy, complex and onerous. Large amounts of information is needed, often at a level of specificity that cannot be known in advance, and which often focuses on administrative aspects, which obscures rather than reveals the scientific value of projects. The time and effort needed to understand

requirements and complete applications – especially given that a large number of these proposals will subsequently be rejected – was felt to discourage some potential applicants from participating. A small number of concerns were also raised about the qualifications and expertise of those assessing the proposals. *Several contributors suggested that a two-stage proposal process would be more suitable, with a short 'pre-qualification' proposal first (focused on outlining research and goals), which would be reviewed and assessed quickly by the EC, followed by a longer more detailed application. In such a system it is envisaged that a light-touch, first stage would tolerate much lower hit-rates than at present, while the managed second stage (full proposal) would aim for much higher pass-rates, which would reduce unnecessary expense and encourage additional applicants (particularly amongst smaller businesses) to come forward and express interest*

Contract negotiation – this stage of the FP participation process is often considered confusing and unduly lengthy. Respondents have experienced protracted negotiation periods, which can cause delays in starting projects, shorten the actual time available for research and cause other knock-on issues (e.g. around recruitment); it can also reduce the relevance / timeliness of the proposed work. *Speed and better communication are seen as important areas for improvement in relation to contract negotiation*

Funding rules / eligibility – EC funding is considered inflexible and insufficient. In particular, the amount of funding provided to cover overheads (management/admin) does not reflect the true costs involved (one estimate put management costs at 25% of the total project cost). The uncertainty caused by exchange rate fluctuations (UK participants are paid in Euros) is also an issue for some. In addition, respondents reported that the eligibility requirements are not sufficiently flexible to cater for different situations and the EC does not pay for VAT, even though this is charged by the UK Government (this comment referred to FP6 and it was suggested that the issue might no longer exist). *UK Participants would like to see early pre-payment to allow for advertising and recruitment of new posts, quicker payments in general and a recognition of the true administration and management costs involved in FP project participation*

- **Reporting procedures / rules** – the number and complexity of forms and reports to be submitted is considered excessive. Respondents also reported a lack of clarity as to requirements, ambiguity in instructions given and lengthy delays in EC responses. In addition, the insistence on original signed hard copies at every stage of reporting is considered unnecessary, expensive and environmentally harmful. *Participants would like to see reporting procedures simplified, clarified and aligned with best-practice, as well as a better balance between research reports and other financial / administrative reporting*
- **Consistency of approach** – there are inconsistencies between the approaches of different project officers and in their explanations as to requirements and compliance. Churn in assigned EC officers during the course of projects is also an issue as it causes further inconsistencies and a need to re-start relationships. *Participants would appreciate greater consistency between project officers and between the project officers and EC financial staff, as well as a reduction in the frequency at which project officers change during the course of projects*
- **Support and advice** – Information available on the Internet is unclear and difficult to navigate (even if you know what you are looking for). There have also been problems with unavailable / crashing websites. There have been issues in the ease with which EC officials can be accessed and the speed with which responses to (even simple) questions are provided. *Participants have suggested that there is an issue with understaffing and that more officials are required to achieve appropriate service levels*

6.11 Participant recommendations

Respondents were asked what changes they would like to see introduced for FP8, which might enhance UK involvement and the benefits derived. Over 600 comments were provided, which covered suggestions for changes at the national and European levels.

The most common changes desired at the European / FP level were as follows:

- **Topics/themes** – Less restrictive and proscriptive, with more flexibility in work programmes to enable a wider range of participants and projects to fit within objectives. A good balance between

different types of research (basic, fundamental, applied, exploratory, exploitation, etc.) and between topics that are 'hot' (e.g. climate change) and those that are not

- **Project size** – Greater emphasis and focus on small and medium-sized projects and instruments and less on thinly spread networks
- **Funding** – Increases in the level of EC contributions to actual costs, higher cost-recovery for participants (especially SMEs) and faster, earlier payment (especially for smaller organisations with cash-flow issues). Prune administration/management requirements in order to switch more funds to research, communication and dissemination
- **Information** – Clearer instructions regarding the various processes and requirements and more streamlined (online) information about the FP more generally
- **Partner searching** – Improved methods and support for searching out and finding interested parties and joining existing consortiums
- **Proposals** – Shorter proposals and a two-stage application process, with a 'pre-qualification' or 'outline application' stage to reduce waste and encourage greater involvement by smaller organisations
- **Evaluation** – Better quality, more transparent and faster evaluation and negotiation processes. Greater emphasis on research excellence when determining the award of grants. High-quality evaluators and greater transparency as to who these evaluators are
- **Administration** – Reduced / simplified administrative requirements (as discussed above)
- **Support** - Improved central support and more and faster responsiveness to queries

The most common changes desired at the national level, within the UK, were as follows:

- **Influencing the FP** – Greater, more coordinated UK (BIS, RCs, etc.) efforts to influence policy and strategy of FP, along the lines already discussed above (seeking inputs bottom-up, being proactive, coordinating activities, lobbying, etc.)
- **Alignment** – Closer alignment between UK/EU strategy, priorities and funding
- **Information** – Clearer communication of the entire FP8 process (when it will launch, how much money, what calls, when meetings are planned, etc.) on a single well-structured website
- **Support** – Encouragement for the establishment of central support functions within larger institutions (for applications and advice). Support, information, training and assistance offered nationally, especially to smaller players and the less experienced. Greater levels of specific, targeted encouragement and support for industry and SMEs

Respondents were asked to describe any ways in which national or institutional support for prospective FP applicants might be improved. Over 500 suggestions were provided, which are summarised below:

- **Influencing the FP:** Greater centralised efforts to influence the FP through increased communication with the research base and increased involvement in and knowledge of European activities. Increased encouragement and support for individuals and organisations to take action themselves to influence the FP, with necessary information on how and when this can be done and support for direct participation in processes
- **Information:** Provide early information on calls and opportunities. Provide formal (e.g. written / web-based) information and guidance on making an application, particularly in relation to administrative requirements, with hints, tips and advice on writing successful proposals. Provide information days and workshops to give information and training
- **Financial support:** Make funding available to support the application phase (e.g. covering travel, networking, effort and / or external expertise). Provide adequate and readily available co-funding for successful applications
- **Administration / application support:** Establish offices / functions / individuals within organisations who can support or do the entirety of the administrative side of application preparation. Nationally, provide a central helpdesk of dedicated support staff who understand FP

mechanisms and have good links with officials in Brussels. Offer one-to-one support from dedicated experts in developing high quality proposals that will be successful in competition

- **Encouragement:** Encourage participation through providing information on the opportunities and benefits of participation, highlighting past successes and by ensuring national funding bodies maintain and interest in and give sufficient status to FP participation
- **Collaboration:** Provide and support networking activities to share knowledge and best practice, help establish new links (especially industry - academia) and enable partnership formation
- **Alignment:** Increase alignment between UK funders/funding and FP. In particular, the Research Councils should have greater knowledge of and involvement in FP, be more proactively involved and ensure closer alignment with their priorities and funding

7. Stakeholder interviews

7.1 Introduction

This section of the report presents a synthesis of the interviews conducted with 50 or so stakeholders from amongst policy teams, national research agencies and major participants. The material is organised around the core study questions.

Several contributors prefaced their remarks with a cautionary note, which amounted to a qualification as to just what one might mean when talking about a concept such as the alignment between a national science and innovation strategy and an international research programme. In short, people suggested the UK government ought to be looking for broad compatibility on several fronts[22]

- On policy objectives (philosophical)
- On research priorities (topical)
- On research administration (instrumental)

7.2 Strategic alignment between the FP and national strategies

There was a broad consensus across all stakeholders that FP7 priorities align reasonably well with the UK's national science and innovation strategies and funding.

A minority of respondents, with knowledge of previous FPs, were of the opinion that the Framework Programme had been moving steadily closer to the policy thinking behind UK science and innovation strategies.[23]

The points of convergence all related to developments in Brussels rather than London and Swindon, and include: the recognition of the importance of scientific excellence, through the creation of the European Research Council; an increasing commitment to balancing top-down with bottom-up arrangements, with new schemes like ERANET or JTIs; and evidence of some small progress towards a focus on outcomes rather than simply work programmes and finances.

The addition of the ERC within the overall FP offer is regarded as being a strongly positive development, bringing the FP philosophy much closer to UK thinking as expressed in key policy documents, such as the 10-year science and innovation investment framework. Which is to say that a research funding system should ideally encompass support for 'pinnacles of excellence' across the (European) science base, as well as support for applied research of strategic importance. This view is expressed most strongly by the academic community and its principal funding agencies, the grant-awarding research councils.

On research priorities, there was a consensus that FP was devoting a sufficient part of its resources to funding work of particular interest to the UK. This overall view was echoed across the FP areas too, where individual programme-committee members or research funders expressed their general satisfaction with the fit with national priorities.

There are several points where respondents note useful, positive progress on the alignment question, realised through successive FPs, including:

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[22] The term alignment implies a degree of precision as regards the desired fit and inter-operability of these two entities, which is not entirely appropriate. Respondents preferred the more subjective notion of complementarity and added value, and above all, talked about the need to maintain perspective: the FP is an international undertaking, pursuing socio-economic and other gains on behalf of 27 countries. In that sense, the FP might be considered to be 'aligned' if it is in the same space philosophically as national policy and is pursuing a significant number of issues that a majority in the UK would endorse as being of very great importance. Moreover, respondents insist that such a programme must invest in issues that are not relevant to or are not a priority for the UK. Lastly, the FP must prefer European-level outcomes and cannot be optimised around the particular ambitions of any individual member state or region.

[23] There was a very much more limited view of the degree of alignment between earlier FPs and UK science and innovation strategies, simply by virtue of the fact that a majority of respondents, especially amongst the delegates to the programme management committees, had taken on their FP brief recently and within the term of FP7.

- The very substantial increase in funding available for environment and energy-related research, moving from FP6 to FP7
- The extension of support in FP7 to encompass the humanities
- The addition of a security thematic area, in FP7

Respondents recognise that the FP must address a spectrum of thematic priorities resolved through its consultations with the 27 Member States, a proportion of which will almost inevitably be in areas where one or more member states has little or no strategic interest.

There was no sense that these natural compromises have produced a spread of priorities and investments that is fundamentally out of balance, from a UK perspective. When pushed on this point, contributors took the view that the UK would benefit from a refocusing on the grand challenges, if that meant a reduction in several of the more traditional technology areas, like automotive and ICT, where the UK has design and software interests but little manufacturing capacity.

Policy departments noted a natural limitation to the FP's strategic fit with their most pressing evidentiary requirements, where the programme's speed, or metabolic rate, was said to be incompatible. Their most important questions are addressed more directly and speedily through in-house research programmes and commissioned studies. By contrast, the FP is better suited to making contributions to the status of knowledge in areas of longstanding and more enduring subject areas whether that is through the development of (international) standards or the accumulation of wide-ranging empirical data.

As might be expected, interviews with FP participants – all larger, research active organisations – did reveal a sense of ebb and flow as regards the relevance of successive frameworks. There will be winners and losers at this level. For example, there has been an increased emphasis on genomics research, which has suited UK research institutes, similarly, the growing interest in food security has produced a meaningful increase in the numbers of projects to get involved in. Elsewhere, respondents remarked on the shift towards work that has more explicit socio-economic or policy goals, which has reduced opportunities for technology centres to lead projects. Several contributors, from the business and RTO communities, bemoaned the fact that the FP had become more academic and was increasingly less concerned with hard technology of relevance to industry.

There are several national priorities, where respondents see potential value in increased international collaboration, where the FP has so far not defined European priorities or chosen to issue calls for proposals. The most obvious gaps were the low level of explicit support for areas like high-value services and the creative industries.

Turning to the last of the three 'alignment tests,' respondents noted several important tensions between the national modus operandi and the administrative requirements of the FP. Perhaps most fundamental, are the practical differences – incompatibilities even – between the manner in which the UK government funds or subsidises research and that of the Commission. The former increasingly uses simple contracts that are lightly monitored and managed against outcomes, where the latter's contracts are required to prescribe tasks and deliverables in great detail, which must be associated with precise amounts of expenditure and specific time. The tensions relate less to the challenges of specifying things that are somewhat uncertain, and the burden of reporting on this, and more to do with the rigidity this imposes on consortia, which many respondents consider somewhat inimical to good research.

7.3 FP Leverage

There is a broad consensus that FP funding amounts to a materially significant additional income stream nationally, in comparison with national research expenditure.

This was believed to hold at the aggregate level and at the level of most if not all of the thematic and priority areas. At close to £600 million a year, overall UK income from FP7 is almost double the size of the Technology Strategy Board and is broadly comparable with the EPSRC's annual budget. At the priority area level, financial leverage is somewhat more variable, amounting to perhaps 1% of UK public funding for humanities research through to 10% for ICT.

Contributors were unsure about the destination of funds in their respective areas. People were unable to judge the extent to which the FP was punching above its weight by virtue of targeting investments on sub-fields where the UK has particular research strengths.

There is a presumption that this is the case, simply by applying the logic that the UK has wide-ranging and world-class expertise in science and engineering and that the FP is a broad-spectrum programme.

The picture is rather more mixed from an industrial perspective, echoing the concerns above raised in the discussions of 'alignment.' The FP is missing several important areas of UK commercial strength, particularly around the creative industries, financial services and even pharmaceuticals. It is also spending a substantial part of its total budget in areas like nano and ICT, where the UK has a smaller and arguably weaker industrial base than others elsewhere in Europe.

Many interviewees are relatively new in post, and as such there is a limited overview of how things have evolved through time and across successive FPs. However, there was a consensus that the doubling of the FP budget between FP6 and FP7 had increased its relative importance within the national landscape, and that the scale of income was making a difference to its ability to leverage and otherwise make a difference to national endeavours. Tightening national budgets might serve to further amplify its contributions.

7.4 Participation of key research groups

The stakeholder interviews produced insight and surprise. Taking the last first, a majority of contributors did not have a systematic view of the individual groups and organisations participating in the FP area of particular interest to them. People build up their own picture, through assembling various pieces of intelligence, whether that is attendance at FP events, ad hoc enquiries made to them, or Commission reports on a given call for proposals. The participant 'directories' are highly personal and not written down, there is no simple means – nor expressed demand, it seems – by which delegates or other stakeholders can generate or maintain a complete list of participants. National contact points get closer through their marketing and communications databases, however the extent of the match is unclear. With hindsight, such an arbitrary command of one's market-place must at least run the risk of poorly targeted communications and misdirected consultations and it is an obvious potential blind spot around leavers, joiners and the not persuaded. Understanding the motives and achievements of the majority is arguably insufficient. Standing outside looking in, this state of affairs looks less than ideal, and it is tempting to suggest BIS might wish to look again at its practicable options as to how this rather fundamental market intelligence platform might be more systematically marshalled and shared.

Turning to the substance of the discussions, the programme-committee delegates and experts tended to take the view that some leading groups elect to get involved, while elsewhere their counterparts and peers choose not to. This "some do, some don't" view of the world was thought to hold at the level of sub-fields, and not just at the level of disciplines.

Perhaps of equal interest, several contributors noted that the reports on individual calls, which include details on the lead partners, often reveal a much wider distribution than might be expected, with a meaningful proportion of major awards going to organisations that would not figure in an agency's UK top 10 for that sub-field. This suggests that universities can use the FP to access areas where they might struggle to compete nationally, taking advantage of their command of a broader set of requirements – management, consortia, inter-disciplinarity – than might typically drive the peer-review process at home.

Participant interviewees took an opposing view, and stated universally and categorically that the UK's best research groups, in the university and institute sectors, were fully engaged with FP, where it was relevant to them. However, all stakeholders were in agreement that business involvement was very much more patchy, and proportionately much lower than many other EU member states.

Explanations for involvement or non-involvement were somewhat tentative, with interviewees suggesting that primary reasons were twofold: the relatively high cost and bureaucratic rigidities of the FP, as compared with the cost-to-income ratio of national funds; and the slow metabolic rate and all-round sluggishness of the FP, as compared with national schemes, which is frustrating on the one

hand, but can also render the scheme inappropriate on the other, when interests are time-limited. This appears to be particularly challenging for businesses and for policymakers.

Secondary arguments included a widely-held impression that some researchers simply find off-putting the need to pursue their work in the context of such very large consortia and across such extensive geography and cultures. In some cases, people perhaps rightly conclude the model is simply not appropriate, gratuitous even. Elsewhere, people noted that larger companies are somewhat antagonistic towards the basic rules of the scheme, and particularly around the expectations on the members of partnerships and the rights to use and commercialise any intellectual property.

Only a minority was prepared to shoulder the not inconsiderable burden of building consortia and leading projects. Others were thought to be more opportunistic, relying on their international standing and reputation to attract invitations from interesting / strong projects lead by others. Significant numbers of leading research groups were thought to view FP awards as being less attractive than national grants, wherein levels of bureaucracy were more acceptable and funding models more appropriate to the requirements of full economic costing. Several commentators noted a longstanding view that FP research is rather more variable in terms of its scientific quality and that wider policy concerns, particularly the 'cohesion' objectives, have acted as a disincentive.

7.5 Support for gaps in UK national funding

Respondents did not believe the FP had addressed major thematic gaps in UK science and innovation funding, however there were a number of exceptions cited by policy departments where occasionally marginally useful tools and standards had been produced that would not have been funded nationally.

Several participants noted that national programmes provide the bedrock for capability building, which facilitates access to the FP: no national funds tends to mean one has fewer and less strong groups, and the prospects for success are likely to be very poor for a second- or third-division UK player.

The great majority noted that the principal gap addressed by the FP was less thematic than it was instrumental. It amounted to a very substantial additional fund for supporting *international* research collaboration, financing research rather than people, and as a result facilitating the development of much more consequential and enduring overseas partnerships. Its mobility funds are also much larger than the equivalent national schemes, and, as such, the FP has made a very substantial contribution to the UK's ability to attract Europe's best talent to its labs, with all that this means for scientific excellence and productivity, and to the country's reputation as a preferred international partner.

There was also a view that the FP had been a source of substantial additional funding for supporting technology development and innovation for smaller businesses with little or no in-house research capability. The £30M+ a year flowing from the SME-specific measures was said to amount to a very substantial uplift in national funding available through for example the Grant for R&D scheme. Indeed, the £100 million plus a year flowing to UK businesses is a very substantial uplift on national funds available for technology development (the Technology Strategy Board has an annual budget of around £300 million).

7.6 Impact on research capabilities

When the interviews turned to the subject of FP impacts, it became clear that the members of the programme management committees, and their national contact points, have a very poor view of the specific outcomes. Most could only talk in very general terms, and stated that their impression was that participants derive the greatest benefits and that those benefits tended to revolve around enhanced international friendships and visibility.

Participants confirmed these impressions, with all contributors citing stronger international relationships / networks and improved awareness of the issues at hand. Businesses and RTOs also added that the FP does provide a very good / unique opportunity for trialling and demonstrating novel solutions.

Several contributors reported researchers becoming more open minded with respect to their preferred approach to things or indeed their key references as regards seminal work or leading centres of excellence. FP was thought to broaden and enrich people's outlook, too.

Most contributors were not able to comment on the FP's impact on researcher skills and careers, although one commentator did remark that the numerous and exacting demands made by the Commission services might very well be sharpening researchers' administrative skills. There was some speculation too that participating in these large projects was a powerful lesson in the risks of poor project management and intra-partner communication.

7.7 Impact on industrial development and competitiveness

The great majority of stakeholders had no view of the main impacts of the FPs on UK industrial development / competitiveness, however the individual businesses were clear that they themselves derived substantial benefits. These ranged from an improved awareness of the capabilities of prospective partners and competitors, a similar improvement in their command of the key issues and direction of travel (cutting edge) and of course relationships with other parties, which might facilitate subsequent commercial collaborations or market access. There were differences evident too between larger and smaller companies, with the former concentrating on the softer benefits, while the latter also derive much value from the additional income, which managed carefully can provide huge leverage to their internal R&D budgets.

7.8 Impact on policy development

The FP has a clear remit to fund research relevant to policy at the European level, and in many policy areas, from agriculture to food safety, harmonisation means that there is a strong coincidence of interests at the European and member state levels.

The great majority of stakeholders had a narrow view of UK policy developments attributable in some degree to the findings arising from the FP. This limited knowledge of policy outcomes was evident across all stakeholder groups, including ministries with a primarily policy interest in FP.

Policy makers were unanimous in their support for the FP, however, and all cited specific cases where the FP had permitted important work to be undertaken. FP outcomes were not expected to be new or better policies, but rather platforms for better policy, specifically:

- Stronger relationships with one's counterparts around Europe, whereby policy teams know one another on a personal level and where pressing questions arise that have an international dimension meaningful, multilateral conversations can be held within a matter of days.
- An 'effective' increase in the volume of research funded in areas of national policy interest, but which are not the highest priority and as such warrant little or no domestic research expenditure. In the main, priority questions are addressed through ministries' own research programmes in order to ensure relevant work is commissioned quickly and with a direct link to a policy customer. The ERANETS have proved popular in many UK government departments and executive agencies, with policy teams participating in networks or co-financing research programmes across the policy spectrum, from environment to food to transport.
- An increase in awareness regarding overseas colleagues' priorities and research programmes, which does lead to ad hoc knowledge transfer and might in the fullness of time permit some degree of reduction in unnecessary duplication of research
- An ability, from time-to-time, to more readily address questions one might struggle to progress nationally, whether that is to do with limitations in domestic scientific capacity or the additional insight one might obtain through an international scope.

One interviewee remarked that if a European programme did not exist then member states would be pressing the Commission to create a policy-relevant research scheme.

Contributors were adamant that their organisation's research strategies and funding priorities had not been influenced by the FP in any material sense, and were not expecting to see such changes in the future. As noted elsewhere, a multilateral initiative of the scale and scope of the FP cannot hope to match the levels of control that an individual government department can achieve through its own investments or indeed through specific, targeted bilateral research programmes. In just one case, a research council stated that its strategic planning process did now include formal consideration as to if and how international schemes, of which the FP is one of the most important, might best be exploited in order to deliver its strategy.

7.9 Impact on international collaborations

All contributors took the view that the FP was sufficiently large and special to have had a positive impact on the nature and extent of collaboration between the UK academic and industrial communities and their counterparts abroad. No one had a view on the extent of knowledge and technology transfer enabled through these relationships.

7.10 Impacts and instruments

On balance, it seems that UK stakeholders value two things above all else from amongst the FP's portfolio of instruments: they like the scale and international scope of the work that can be supported through a Framework scheme; and they like the growing number of bottom-up instruments that permit stakeholders – whether policy makers, research councils or businesses – to get involved in programme- or project-scale activities that fit their priorities exactly. The addition of the ERC was also very widely endorsed, although not by businesses or RTOs who see this as a major financial and intellectual distraction from Europe's competitiveness issues.

Contributors had very different levels of knowledge regarding the panoply of FP instruments, so for example, the ERC uses just two instruments, neither of which is deployed anywhere else in the FP. Similarly, the research infrastructure area has a single instrument, the I3s, which is not used anywhere else. The other point that emerged was that for every two or three plaudits given to an instrument, we found a detractor able to make a strong case regarding its limitations.

The integrated projects were well regarded by most, permitting a scale of collaborative-research activity not easily replicated through national schemes, and with the added advantage of accessing unique competences and more extensive value chains. The scale and scope permitted was believed to be really important to people's ambitions to move forward a research agenda. People noted certain risks inasmuch as these very large projects and consortia are hugely difficult to manage and can sometimes dissemble.

Several contributors expressed concern over the presumption that collaborative research should be pursued almost exclusively through very large projects with budgets of EUR 10 million rather than 1 million. In some areas, and for some research questions, critical mass is achievable with 5 people not 50. Such a monolithic view was thought to be rather wasteful, in some areas and with regard to certain questions at least: better to pose the challenge and allow the community to determine the very best methodology and price that work accordingly.

The Networks of Excellence generated few comments, as they have largely run their course, however a minority of contributors did offer the view that this kind of partnership-building and knowledge-sharing structure should have been hugely valuable for progressing the ERA and for helping to address the FP 'Achilles heel,' demonstration and exploitation. The idea that such networks would become self-sustaining was thought to be naïve, and that the very much more restricted support under FP7 could only lead to the closure of the remaining few networks: there was a sense that the Commission had consciously or otherwise 'thrown out the baby with the bath water.' A great deal of goodwill was thought to have been lost.

The ERC Starting Grant has proved to be particularly attractive, and providing a very substantial additional 'fellowship' fund for early-career researchers as compared with the national schemes on offer through various research councils. While there are very many national schemes, most are small

and competition is fierce. The ERC is a welcome boost in terms of the volume of funding available, and should ensure the UK research base is able to retain a larger proportion of the very best people in research careers. Attrition levels amongst young researchers are perhaps too high, and while this does focus the mind (on excellence) it might also be said to be somewhat wasteful of training and talent. There is an element of overlap with the Marie Curie scheme, however not to the extent that this is producing perverse incentives for young researchers in the UK. The ERC Advanced Investigators Grant has proved much less attractive, as there is substantial response-mode funding available through the UK grant-awarding research councils where success rates are better too.

Marie Curie Actions are well regarded and are seen as a valuable source of additional capacity as busy UK labs struggle with the limited numbers of fellowships available nationally. MCAs really only confront two challenges, the first being from industry, and the eligibility rules, which essentially exclude them, and the second being from university HR people who perceive an inflationary pressure on researcher wages as MCA allowances are very much more generous than a typical stipend.

The I3s have worked well, providing large numbers of UK academics with access to a long list of novel and interesting facilities that is not readily available nationally. The STFC was also complimentary about the role of the I3s in helping Europe's scientific communities to have more extensive dialogue around common needs, outside FP.

Government departments tended to favour the ERANETs above all else, and in particular the ERANET plus scheme, as this approach permits policy teams or industry-sponsorship groups to define research agendas and funding levels. This was not a universal view however, and at least two of the research councils expressed concerns over the protracted process through which partners exchange information and negotiate a common agenda, which risks national agencies being obliged to provide substantial funds to support research they believe to be irrelevant and or below their own quality threshold. Bilateral or trilateral partnerships tend to suffer much less from these kinds of quality issues.

The JTIs were highly regarded by BIS industry teams and the Technology Strategy Board, for similar reasons to ERANETS. Research agendas can be defined bottom up and funding can be provided more quickly and more flexibly than one can achieve through the mainstream FP areas. Artemis and Eurostars were singled out as particular success stories here.

8. Conclusions and recommendations

8.1 Introduction

This final section of the report brings together the main findings from each of the individual data collection activities, presented separately in the preceding sections, to bring out points of convergence and divergence, and to reach a conclusion on each of the study questions.

8.2 Strategic alignment between the FP and national strategies

Overall, there is clearly a good degree of alignment between FP priorities and national strategies and funding. There is also evidence to suggest the strategic alignment has improved substantially with FP6 and FP7, as the Commission has moved to extend its support to basic research at the European level and has begun to experiment with more flexible, programmatic instruments, where participants and member states can play a fuller role in determining research agendas and investment portfolios.

The document analysis suggests there is a good fit between current national research priorities (e.g. from BIS, TSB and the Research Councils) and the research priorities of FP7. There are a small number of gaps evident, which reflect the UK's more recent interest in extending its development efforts to the services sector (financial services, creative industries) and non-technological innovation. The growing interest in innovation in public services is also an area where one might argue the UK is taking a lead.

The participant survey reinforced this analysis, and revealed that 85%+ of the researchers believe that the FP topics and instruments are of medium-high relevance to UK research ambitions.

Lastly, there was a broad consensus across all stakeholders that FP research priorities do align reasonably well with national science and innovation strategies and funding. This overall conclusion holds true from several perspectives. On modus operandi, there was a strong sense that successive FPs had moved closer to UK science and innovation policy, particularly through the implementation of the ERC and several more flexible, bottom-up instruments, from ERANET plus to the Joint Technology Initiatives. The much discussed ideas for the next generation Framework Programme, FP8, with the addition of novel concepts and instruments, like Grand Challenges and Joint Programming in particular, were expected to move the FP even closer to UK thinking. This of course subject to the detail design and balance between these elements and favoured, existing arrangements, like the ERC. There was a thought that there might have to be more work done to arrive at a common understanding of some fundamental concepts, such as research excellence, or indeed, innovation.

On research priorities, there was universal agreement that national and international ambitions were in broad alignment, whether that was to do with energy security or food safety or health. The fit is less good at lower levels of resolution, where for example, areas like marine or public engagement or security are much more broadly defined in Brussels than they are in the UK, which necessarily means a meaningful share of total investment in these key areas will be devoted to topics that are not priorities nationally. People were sanguine about this, arguing that any multilateral scheme must by its very nature fund work from a menu that is bigger than any one country might choose for itself.

On instruments, the scale of FP income dwarfs national funds for international research and networking and as such is hugely complementary to the country's growing ambitions with respect to global science and innovation.

There were two aspects where alignment is less good, and which perhaps constitute an opportunity for discussions between BIS and the Commission.

The first is an old chestnut and relates to balance of investment across the thematic / sectoral priorities, with a very substantial proportion of total spend being devoted to automotive- and ICT-related technologies, where the UK has a very much smaller industrial base and a different set of technological capabilities. There has already been change in a positive direction from FP5 to FP7, and the talk of grand challenges as an organising framework for FP might very well bring this closer still. Notwithstanding this, commentators hope it might be possible to broaden the sectors addressed to

better match the UK and Europe's knowledge economy, with greater attention to high value services and the creative industries in particular and an increased sensitivity to the importance of non-technological innovation.

The second point of difference was the UK's much sharper focus on outcomes, and its more trusting approach to the people and organisations that are being sponsored to deliver those social and economic advances. The FP in most areas continues to be heavily front-loaded in procedural terms, divining priorities at something approaching a project level and committing most of its administrative resource to contracting and financial management.

8.3 FP Leverage

The FP expends sufficient sums to produce significant financial leverage in areas of UK strength, and this has become more apparent with the very substantial expansion in FP budgets in the transition from FP6 to FP7. Even with the credit crunch, there is an expectation that FP8 will be larger again.

UK income from FP7 will be in excess of £500 million a year, which is a very substantial amount of money, approaching 10% of the national science budget and equivalent to a medium-sized research council.

The distribution of those funds is rather uneven across the 20 or so thematic and priority areas of the FP, ranging from a few millions for science and society to many hundreds of millions for ICT and health. The UK's income profile is determined in the first instance by the structure of the FP itself: science in society is a small priority area, while ICT is a very large area, with an EC budget that reads more like a telephone number.

Within that basic structure however, UK proposals success rates and funding suggest national demand / capabilities does play a role. Using FP6 statistics, as these are complete, one can see that the UK secured around 23% of all EC funding in two areas, Marie Curie and Research Infrastructure, with a combined income of more than EUR 550 million. Elsewhere, UK participants secured 15-16% of all EC funds in life sciences, aeronautics, food quality and citizens and governance. It secured a rather below-par, 10-11% in three of the largest thematic priorities: ICT, nanotechnology and sustainable development. Those statistics speak to the relative success of a very large / strong public-sector research base and a rather smaller and less technologically dynamic medium-tech manufacturing sector. The strength of the countries private RTOs is revealed in the 17.6% share of EC income won from the SME-specific measures. The first calls of FP7 suggest this pattern is repeating itself, and in some senses has been reinforced with the addition of the ERC (20% of EC contractual commitments from first two calls).

There was a broad consensus across all stakeholders that FP funding amounts to a materially significant additional investment in each of its broad thematic areas, in comparison with national research expenditure. As to leveraging areas of strength, all respondents believed the UK has research strengths in their particular FP area and that the programme must be consolidating and extending areas of excellence. Interviewees also pointed to the very substantial benefits that can derive from increased international engagement, with all that might mean for improving access to different skills and facilities on the one hand and larger and more diverse populations and data on the other.

While there were no exact figures available, the leverage appears to fall in the range 1-10%, depending on the area: so for example, EUR 100 million a year on health and life sciences is perhaps 2% of national public spend in that area, while a roughly similar spend on ICT is probably close to 10%.

The leverage is arguably an order of magnitude higher when one considers this is income for international research collaboration and networking, an aspect of the national science and innovation portfolio that is funded at a fraction of the levels of domestic activities.

8.4 Participation of key research groups

A majority of the UK's research universities, research institutes, RTOs and technology companies is involved in Framework. Most *dedicated* research organisations, from national research institutes to private labs, have been involved actively in Framework over many years, and in many cases stretching back beyond FP4.

The picture changes as one drops down a level in resolution, with much more variability across university research groups and indeed across business sectors.

The desk research compared FP6 participant records with RAE2008 profiles, and revealed that all of the UK's leading universities were involved actively in FP6. Re-running a similar matching process using FP6 participant data and the 2008 R&D Scoreboard produced a rather mixed picture for industry, with evidence of strong involvement by leading players in several sectors (aerospace, energy, telecommunications), while the majority of businesses from several other research-intensive sectors were typically not involved in FP6 (e.g. pharmaceuticals and biotechnology).

The stakeholder interviews produced insight and surprise. Taking the last first, a majority of contributors did not have a systematic view of the individual groups and organisations participating in the FP area of particular interest to them. People build up their own picture, through assembling various pieces of intelligence, whether that is attendance at FP events, ad hoc enquiries made to them, or Commission reports on a given call for proposals.

Participant 'directories' are highly personal. National contact points get closer through their marketing and communications databases, however no-one appears to have particularly good evidence as to why groups come and go, or simply stay away. Some further work on developing our market intelligence – getting beyond folklore – might very well pay dividends.

The programme-committee delegates and experts tended to take the view that some leading groups elect to get involved, while elsewhere their counterparts and peers choose not to. This "some do, some don't" view of the world was thought to hold at the level of sub-fields, and not just at the level of disciplines. Of equal interest, several contributors noted that a meaningful proportion of major awards go to organisations that would not figure in an agency's UK top 10 for that sub-field.

Participants took an opposing view, and stated categorically that the UK's best research groups, in the university and institute sectors, were fully engaged with FP, where it was relevant to them. All stakeholders were in agreement that business involvement was very much more patchy, and proportionately much lower than many other EU member states.

The composition analysis revealed that, in numerical terms at least, private commercial organisations make up a majority of UK participants, with more than 600 unique, UK-resident private companies involved in FP7, or 67% of the total to date. The equivalent figure for FP6 was 1,150 and 44%. The equivalent FP6 figures for HEIs and research institutes, were 453 and 337, numbers that suggest perhaps 90% of all public-sector research organisations have been involved with FP in the past.

The picture changes radically when one switches to participations – one organisation might have one or many participations – and income: on these measures, UK businesses, account for closer to 22% and 13% respectively. Comparison with the statistics for France and Germany runs counter to popular opinion, showing broadly equivalent shares of total national participations. However, UK firms do account for a much lower share of total national income, compared with other leading member states, which suggests the issue is not one of participation but the nature and intensity of engagement.

Explanations for involvement or non-involvement were somewhat tentative, with interviewees suggesting that primary reasons were twofold: the relatively high cost and bureaucratic rigidities of the FP, as compared with the cost-to-income ratio of national funds; and the slow metabolic rate and all-round sluggishness of the FP, as compared with national schemes, which is frustrating on the one hand, but can also render the scheme inappropriate on the other, when interests are time-limited. This appears to be particularly challenging for businesses and for policymakers.

Secondary arguments included a widely-held impression that some researchers simply find off-putting the need to pursue their work in the context of such very large consortia and across such extensive geography and cultures. In some cases, people perhaps rightly conclude the model is simply not appropriate, gratuitous even. Elsewhere, people noted that larger companies are somewhat antagonistic towards the basic rules of the scheme, and particularly around the expectations on the members of partnerships and the rights to use and commercialise any intellectual property.

8.5 Complementarities

The UK science and innovation system is large and broad-spectrum, and as such there are no major thematic areas where the FP is active and the UK not.

Stakeholder feedback suggests that there are differences in scope between national priorities and FP priorities in almost every area, however this appears to be a case of the FP being more expansive topically. This means the FP will spend less on a UK-preferred priority area than it might do, with a sharper focus on only those issues of especial relevance. However, this is unrealistic, inappropriate even, given the need to address issues of common interest to many, if not all, European member states and to capture the more diverse nature of priorities and challenges evident at the European level and with 27 member states.

The major issue with respect to thematic alignment and complementarity is the balance of expenditure across thematic areas and priorities. Several of the FP's biggest investment areas (ICT) address domains where the UK industry and research base is proportionately smaller and arguably weaker than its counterparts in France and Germany. Equally, the FP has taken a more narrowly technological view of research and innovation historically, and this has meant that several of the UK's key assets, areas of international comparative advantage, find few opportunities for support, in for example the creative industries and high value services more generally.

The participant survey provides a different perspective on the question of funding gaps, with almost all questionnaire respondents (94%) stating that in their view, the FPs have addressed gaps in national provision. Almost 40% suggested that this had happened to a very large extent, although much of this feedback appears to correlate with comments about the importance / added value of the FP's international instruments and reach. A majority also noted that another significant point of additional value was the augmentation of national funds to support work in an area that the person in question deemed to be important.

Within the residual 200+ specific cases of funding gaps, there were no more than 10 topics that were cited by more than two people.

In a minority of cases, there is evidence to suggest the historical strengths / interests of researchers elsewhere in Europe – around nuclear power, certain vaccines, aquaculture and fisheries, for example, that the FP has provided smaller UK communities to access much bigger and stronger pools of capability, and that these have helped to strengthen national capacity in those areas. Several contributors suggested the FP had proved to be a useful bulwark against the negative impact of changing national research council priorities, in areas from high-energy physics and astronomy to modern languages.

8.6 Benefits and impact

Surveys and interviews confirmed that the FPs have had the biggest impact on participants' international relationships and their knowledge of a given field. Researcher benefits also include a long list of other welcome achievements, from increased scientific reputation internationally (an organisation's visibility and competitive position) to an improved ability to attract and retain worldclass researchers. More instrumental outcomes – new tools and methods, products / processes, policies, etc, are much less widely reported – and wider impacts on researcher careers, government policies and business competitiveness are only rarely cited. In this sense, the FP looks very similar to any other applied research programme.

It is quite possible however that the broadband data collection methods used here will tend to under-represent the significance of the outcomes, where a much more time-consuming and costly ethnographic study might reveal a very different picture. The more in-depth exploration of policy outcomes did reveal more than 50 instances where UK based participants, from the 1,200 that replied to the survey, cited very specific contributions to policy documents, directives and operational standards.

Members of the programme management committees, and their national contact points, have a very poor view of the specific outcomes. Most could only talk in very general terms, and stated that the principal benefits tended to revolve around enhanced international friendships and visibility (beyond the very obvious funds with which to conduct research). Several contributors reported researchers becoming more open minded with respect to their preferred approach to things or indeed their key

references as regards seminal work or leading centres of excellence. FP was thought to broaden and enrich people's outlook, too.

It is hard to imagine that successful participation in FP projects would not improve a person's ability to collaborate with academics in other countries and disciplines and with other types of organisation more generally. The participant survey suggested that this is indeed the case, with 45% of all respondents stating that the experience had a large, positive impact on their ability to work successfully with universities or businesses in other countries.

All stakeholders similarly took the view that the FP was sufficiently large and special to have had a positive impact on the nature and extent of collaboration between the UK academic and industrial communities and their counterparts abroad. No one had a view on the extent of knowledge and technology transfer enabled through these relationships.

8.7 Impacts and instruments

On balance, it seems that UK stakeholders value two things above all else from amongst the FP's portfolio of instruments: they like the scale and international scope of the work that can be supported through a Framework scheme; and they like the growing number of bottom-up instruments that permit stakeholders – whether policy makers, research councils or businesses – to get involved in programme- or project-scale activities that fit their priorities exactly. The addition of the ERC was also very widely endorsed, although not by businesses or RTOs who see this as a major financial and intellectual distraction from Europe's competitiveness issues.

Contributors had very different levels of knowledge regarding the panoply of FP instruments, so for example, the ERC uses just two instruments, neither of which is deployed anywhere else in the FP. Similarly, the research infrastructure area has a single instrument, the I3s, which is not used anywhere else. The other point that emerged was that for every two or three plaudits given to an instrument, we found a detractor able to make a strong case regarding its limitations.

The integrated projects were well regarded by most, permitting a scale of collaborative-research activity not easily replicated through national schemes, and with the added advantage of accessing unique competences and more extensive value chains. The scale and scope permitted was believed to be really important to people's ambitions to move forward a research agenda. People noted certain risks inasmuch as these very large projects and consortia are hugely difficult to manage and can sometimes dissemble.

The Networks of Excellence generated few comments, as they have largely run their course, however a minority of contributors did offer the view that this kind of partnership-building and knowledge-sharing structure should have been hugely valuable for progressing the ERA and for helping to address the FP 'Achilles heel,' demonstration and exploitation.

The ERC Starting Grant has proved to be particularly attractive, and providing a very substantial additional 'fellowship' fund for early-career researchers as compared with the national schemes on offer through various research councils. While there are very many national schemes, most are small and competition is fierce. The ERC is a welcome boost in terms of the volume of funding available, and should ensure the UK research base is able to retain a larger proportion of the very best people in research careers. Attrition levels amongst young researchers are perhaps too high, and while this does focus the mind (on excellence) it might also be said to be somewhat wasteful of training and talent.

Marie Curie Actions are well regarded and are seen as a valuable source of additional capacity as busy UK labs struggle with the limited numbers of fellowships available nationally. MCAs really only confront two challenges, the first being from industry, and the eligibility rules, which essentially exclude them, and the second being from university HR people who perceive an inflationary pressure on researcher wages as MCA allowances are very much more generous than a typical stipend.

The I3s have worked well, providing large numbers of UK academics with access to a long list of novel and interesting facilities that is not readily available nationally. The STFC was also complimentary about the role of the I3s in helping Europe's scientific communities to have more extensive dialogue around common needs, outside FP.

Government departments tended to favour the ERANETs above all else, and in particular the ERANET plus scheme, as this approach permits policy teams or industry-sponsorship groups to define research

agendas and funding levels. This was not a universal view however, and at least two of the research councils expressed concerns over the protracted process through which partners exchange information and negotiate a common agenda.

8.8 Future development and opportunities for improvement

The study focused on strategic questions in the main: the degree of alignment with national science and innovation policy or the strategic added value of the FP. However, almost everyone contacted during the course of the study did wish to offer a series of observations about the operational aspects of the FP and in particular that while much good progress has been made, it continues to be unnecessarily bureaucratic, costly, inflexible and slow. When asked about possible future developments and opportunities for improvement in relation to the FP, most focused on explaining negative issues experienced through their participation, rather than providing actual 'recommendations' for improvement. Nevertheless, some suggestions for developments and opportunities for improvement to FP8 were identified that might enhance UK involvement and benefits derived. These focused, at the European level, on further developing the themes and types of research supported and reducing the level of bureaucracy. At the national level, suggestions focused on exploring possibilities for inputting to FP development/definition and providing support to applicants and participants.

At the European- or Framework Programme level, there was an almost universal view that the Commission should press on with its simplification agenda, and that there must be many opportunities for improving speed and efficiency while also recognising that this is a multilateral programme with a very particular legal basis. Feedback focused in two key areas where there was felt to be opportunity for improvement: the thematic areas and types of research funded through FP and the administrative and other reporting requirements.

On research priorities, there was no strong pattern from participant recommendations. Similarly with stakeholders, most make an appeal for expanding the part of the FP that best addresses their constituents. However, participants would like to see a better balance of topics/themes and types of research being supported through the FP, reducing the focus on 'hot topics' / new areas and on applied research and exploitation. They would also like to see wider and more open work programmes and calls being developed, with less pre-defined (project-level) specificity and greater flexibility for the scientific community to propose their own ideas for work.

Survey respondents felt that UK agencies/representatives might be able to do more in general to push for UK interests in FP development. As discussed above in the context of strategic alignment, potential changes to FP8 are already expected to move the FP closer to UK thinking, but opportunities will remain for BIS (with other UK actors and the EC) to seek greater alignment between FP and UK strategies and priorities. In particular, the UK should try to broaden the sectors addressed by the FP to better match the UK knowledge economy (including higher value services and creative industries) and encourage a greater focus on the *outcomes* of funded research, rather than the *approach* to delivering those outcomes

The majority of participants appear satisfied or neutral with regard to the various aspects of FP6/7 pre-defined administration and reporting procedures and many stakeholders took the time to complement the Commission on its hard work, and argued that good progress had been made in several areas. However, survey respondents reporting a negative benefit to cost ratio for their FP participation tended to cite various problems with programme or project administration as the main cause. The areas of greatest dissatisfaction were with reporting procedures and mechanisms for payment of EC contributions, while the timeliness of various processes (particularly the application and contract negotiation procedures) were also sources of dissatisfaction for a significant minority of participants:

- The overall level of bureaucracy and reporting involved is considered excessive, requiring a lot of time and effort on the part of all participants and a disproportionate burden on smaller organisations and the inexperienced. Participants would like to see a pruning of these requirements within FP8, as well as simplified reporting procedures and a better balance between research reports and other financial / administrative reporting
- Co-financing is fine in principle, however the level of assistance seems too low given the extent to which the Commission services look to prescribe project activity and outputs, and the administrative requirements involved. Participants would therefore like to see increased EC contributions to better reflect true costs and a better recognition of the administration and

management requirements. Specific aspects of EC funding rules were also highlighted as being overly-restrictive and difficult to access

- The programme tends to move forward very slowly, and uncertainly, which creates waste and opportunity costs. Respondents complained about the timeliness of every step in the process from the call to the evaluation to contracting, to invoicing and payments. Better quality, more transparent and faster evaluation and contract negotiation processes in particular were requested by participants, as well as earlier payment of EC contributions

Other possible areas for development at the European-level, where there was some convergence of opinion included: (i) encouraging the Commission to continue to evolve the portfolio of FP instruments, to create more opportunities for community-led and co-financed research, as well as return to focusing FP funding more on small and medium-sized projects and instruments, rather than large projects and networking activities; (ii) a two stage proposal process, with a light-touch first stage (with lower hit-rates than at present), with a managed second, full-proposal stage (with higher pass rates), to reduce unnecessary expense and encourage additional applicants to come forward; and (iii) generally, clearer information and instructions on the various processes and requirements for FP projects, increased consistency between project officers and less churn in project officers during the course of projects.

At the National level there are felt to be opportunities to exert greater efforts in influencing the FP and its contents and a need for additional support for applicants/participants.

The majority of respondents to the survey did not believe that national agencies or representatives in the UK have had a major influence on FP priorities or instruments in the past (FP6 or FP7). However, many were unable to suggest practicable ways by which they might increase the extent to which they influence FP planning in the future. In part this was because the community is not aware of which agencies are involved or responsible for trying to influence the FPs or increase their relevance, what the process of developing FP priorities and calls involves, and what mechanisms are available that could be used to influence these.

There is a clear desire for greater input bottom-up, with UK representatives and agencies more actively seeking interaction with scientists, research groups and business. Participants would like to: better understand the processes by which FP work programmes are developed and how they might influence the agendas; input views on priorities to delegates early in the process so that these can be fed into programme committees and advisory groups in a coordinated way; and gain information on ongoing developments and the likely formulation of future FP areas/calls, with the opportunity to comment on any draft documents.

Linked to this, participants would like to see assistance, encouragement and support for the direct participation of the research base in the development of the FP. Closer involvement in the processes would allow participants to gain information and experience, provide expert, knowledgeable input to developments and collect information to feed back to the community.

Stakeholders also suggested a need to encourage greater levels of support and assistance to participants and applicants. Experiences vary considerably, but it would appear that participants without FP experience and those not affiliated to large organisations (with dedicated support personnel) are often those encountering the most serious difficulties. Many participants noted that the availability of expert support staff within their organisation to deal with administrative/legal/financial aspects of FP involvement could dramatically lessen the burden on individual participants. For others, national dedicated support staff that understand FP mechanisms and have good links with officials in Brussels would be welcomed.

As was discussed above in relation to the participation of key research groups, there is strong involvement by leading R&D players in some sectors (aerospace, energy, telecoms), but it would appear that a majority of business from several research-intensive UK sectors (notably pharmaceuticals and biotechnology) are typically not involved in FP projects. Improved UK market intelligence may be required on, for example, why groups come and go, or simply stay away from the FP. However, non-involvement is likely to be caused in part by the relatively high cost and bureaucratic rigidities of the FP and its slow metabolic rate and all-round sluggishness. Survey respondents mentioned that they would like to see national agencies and representatives providing specific targeted support to industry, in order to encourage involvement and interest and ensure industry needs are met through the FP.

In addition, there appears to be demand for clearer communication at the national level of the entire FP8 process (when it will launch, how much money, what calls, when meetings are planned, etc.) and information on the opportunities and benefits of participation. Additional funding to support the application phase (travel, networking, expertise and effort) would also be welcomed by many actors.

8.9 Recommendations to BIS

We have three sets of recommendations, which will tend to be mutually reinforcing. The biggest challenge would seem to relate to the issue of widening participation outside the areas where UK universities and research institutes have been hugely successful: life sciences, ERC, Marie Curie, Research Infrastructure.

This relates to business engagement in particular, with whole swathes of businesses seemingly unaware of or indifferent to FP. Moreover, comparing participation data with income statistics suggests UK businesses are playing secondary or otherwise less intensive roles than their counterparts elsewhere in Europe.

Chasing more business involvement is a difficult game, and short-term success can be costly and cause long-term damage, as people are persuaded, against their instincts to get involved in activities that are not wholly suited to them. With that cautionary note in mind, there are perhaps three things BIS might give more thought to:

- Encouraging the Commission to spend a greater share of its total budget through its growing list of more flexible instruments, to reduce wasted efforts, speed up processes and permit faster turnaround on payments
- Explore ways to make more and better use of larger / experienced organisations to bring partners and supply chains with them, possibly even looking to extend the use of the kind of RTO-led club research model one sees in the SME-specific measures
- Pull together more evidence and in-depth case material on the benefits of participation, such that NCPs and others have the kind of marketing platform they need to engage prospective participants

In terms of national arrangements, we recommend BIS look at three issues, each of which might also make significant inroads to the business / SME challenge everywhere described:

- The overall PCM, expert and NCP arrangements, to determine whether things have become too fragmented and dispersed, and, critically, whether the system has sufficient resource in light of the very substantial flow of income from the FP and the 1,000s of organisations that have an interest
- The market intelligence (and FP information more generally) that is available to the national support system, and its adequacy when looked at from the perspectives of: promoting the FP, consulting relevant communities on future priorities and work programmes, disseminating information on programme results and understanding why organisations elect not to participate
- The addition of an FP / international chapter in the strategies and annual reports provided to BIS, by the research councils and others. The intention would be to encourage funders to look more closely at the nature of the FP achievements, such that they can better articulate that added value and provide something approaching an account of its impacts, jointly and severally

In terms of the future and FP8, we have to follow the popular vote and recommend that:

- BIS continue to promote the simplification agenda, possibly prioritising responsiveness and speed over administrative costs. As with any situation where one is seeking to persuade others to change in line with your own ambitions, it makes sense for BIS to develop concrete proposals that model key parameters / trade-offs, while also confirming those innovations remain compliant with relevant regulations. Bearing the cost of such experimentation, should win friends and influence people in other Member States as well as Brussels
- BIS push for early elaboration of the purpose, shape and balance of important new concepts like Grand Challenges and Joint Programming. As noted in the previous bullet point, these arguments might carry more weight if BIS, perhaps with its partners here in the UK, were to set out its own experiences of developing and implementing major programmes (e.g. Innovation Platforms, or cross-council initiatives) marshalled around grand challenges

- BIS explore ways in which it might encourage the Commission that flexible, trust-based contracts are preferable and more consequential than the kind of detail prescriptions required by the present regulations

Appendix A Methodology

A.1. Study terms of reference

The Invitation to Tender stated that the main aim of the study was to produce up-to-date evidence as regards the impact of the Framework Programmes in the UK such that it can inform, in a timely way, the formulation of UK objectives for the negotiation of FP8. The study was also intended to complement the BIS international team's wider efforts to gain strategic intelligence through extensive bilateral discussions and ongoing analysis of new FP evaluations and impact assessments.

The specific objectives of the work were presented in the form of a number of questions to be answered through the study. These are shown in full below, organised under two broad areas of interest: (i) leveraging and enhancing UK capabilities, and (ii) impacts of UK involvement in FPs.

Leveraging / enhancement of UK capabilities

- To what extent have FP4-6 leveraged areas of UK strength, and helped introduce new areas of expertise?
- Are the FPs supporting areas of UK strength, as identified by: (i) the UK R&D Scoreboard, (ii) the Government's industry strategy, (iii) the Technology Strategy Board's priorities, and (iv) the Research Council's priorities?
- To what extent has research funded through the FPs been aligned with our national priorities for funding in academic institutions and business?
- To what extent are the key individuals, institutions and companies in receipt of FP funding generally those that are in receipt of UK national research funding?
- Are the FPs filling important gaps that are not addressed by UK national funding programmes?
- Are the FPs funding areas that are less important to UK research and innovation ambitions?
- Are the FPs increasing UK capacities in emerging areas, where it will need to work with partners in order to have sufficient impact?

Impacts of UK involvement in FPs

- What has been the impact of the FPs on (for example): the number of UK citations, access to infrastructures, increasing European and global influence and profile of UK institutions, research and researchers, contribution to business success in terms of new products and processes, access to European and international markets, start-up companies, and Intellectual property?
- To what extent have the FPs had an impact on UK policy development and allocation of resource?
- To what extent have the FPs had an impact on raising skills?
- Has any additional national funding (public and private) been generated as a result of the Framework Programmes activities in a given area?
- Has the interaction between academia and industry improved as a result of FP?
- To what extent have the FPs made a contribution to encouraging a continuation of business and research collaborations after FP funding has ended?
- To what extent has additional work been done after completion of the FP activity, which would otherwise not have happened?
- Are the FPs strengthening the existing UK portfolio by international collaboration under the 'best with best' criterion?
- What are the FP funding mechanisms most closely identified with successes in the areas above?

The Invitation to Tender envisaged a methodology that would use both qualitative and quantitative methods, requiring desk research and contact with previous participants in FP (among others). The resulting report was expected to include a set of conclusions that would help the Contracting Authority to identify thematic priorities and ways in which FP8 could be structured to better align with UK research and innovation systems and increase UK take-up and success rates.

A.2. Methodological approach

Our methodological approach was designed to fully address the overall aims and specific objectives of the study, and to ensure that we could provide robust answers to all of the questions set out above.

The following sub-sections detail the methodological approaches that were followed in order to collect and analyse the data and information needed to meet these requirements.

A.2.1. Kick-off meeting

A kick-off meeting was held between BIS and members of the study team on the 27th November 2010. The meeting was used to discuss and finalise the agreed scope of the study, the details of the workplan and processes for obtaining the necessary data and information.

A.2.2. Desk research to assess the alignment between UK research strengths / priorities and FP support

Following the kick-off meeting the study team proceeded to carry out an analysis of UK academic and industrial research strengths, based on RAE2008 and Innovation Scoreboard data, published strategies and FP6 participation data. The results of this component of the work were delivered to BIS on 24th December 2009 and were discussed at a progress review meeting held in London on 20th January 2010. The outputs from this component of the study are summarised in Section 4 of the main report.

A.2.3. Analysis of UK participation in FP6 and FP7

Following the kick-off meeting the study team also carried out a factual analysis of UK participation in FP6 and FP7. FP6 E-CORDA data was already held in house covering participations in projects, but an information request had to be developed to assist BIS in obtaining data from the Commission on UK participation in proposals submitted to FP6. BIS also provided data on UK participation in FP7, covering both proposals and contracts.

On receipt of the data the study team carried out a full analysis of UK participation in FP6 and FP7 to date, covering participation in proposals, success rates, and participation in funded projects. The outputs from this component of the study are presented in full in Appendix B (for FP6) and Appendix C (for FP7). The main findings are also summarised in Section 5 of the main report.

In addition to obtaining and analysing data on UK participation in FP6 and FP7, the study team (through BIS) requested and obtained data on UK involvement in other related initiatives not covered by the E-CORDA database. Analysis of the available (limited) data and information on these initiatives is presented in Appendix D , with the main findings summarised in Section 5.12.

A.2.4. Questionnaire survey of UK participants in FP6 and FP7

The study methodology was required to include a survey, directed to UK participants in FP6 and FP7. It was agreed that this questionnaire should be directed to *all* UK participants in these FPs, but that participants would only be asked to complete one copy of the questionnaire, answering on behalf of themselves or their organisations / research group, rather than in relation to a specific project.

Questionnaire development

Technopolis developed a preliminary draft of a questionnaire, with the question set being designed to address the various information requirements contained in the study terms of reference, and focusing on elements that could not be answered through the analysis of participation data or that would not be better addressed through the programme of interviews. In particular it was designed to elicit a more detailed understanding of the extent to which FPs have leveraged areas of UK strength and helped to introduce new areas of expertise, as well as to provide evidence of the impacts of UK participation.

The draft questionnaire was submitted to BIS in January for comment and a small number of revisions were then made based on the feedback received. A full copy of the final survey questionnaire can be found in Appendix E . It consists of 29 core questions, covering the following main areas:

- The relevance of FP6/7 instruments and topics to UK participants, and the extent to which they complement national funding and align with areas of UK strength
- The importance of different drivers and motives for UK participation in FPs
- The importance of different R&D and innovation outputs to UK participants in FP6/7 projects, and the extent to which these were successfully derived

- The realisation of tangible and intangible benefits by UK participants and the impact of involvement on the participants' own organisations / research groups
- The extent to which project results have been used and exploited by researchers, companies and policy makers, both within and beyond the UK
- The overall costs and benefits of participation
- An assessment of project partners and levels of additional collaboration, plus information on the typical roles played by UK participants within projects
- The extent to which UK is successful in influencing the form, content and relevance of FPs, plus strategies for further enhancing this influence
- Feedback on FP6/7 administration mechanisms and reporting procedures
- Recommendations for enhancing UK involvement and the benefits derived from FP8, plus possible improvements to support for prospective applicants

Preparation of contact databases

In parallel with the development of the questionnaire, Technopolis analysed and prepared the contact information relating to UK participants in FP6 and FP7. The FP6 and FP7 databases showed that the UK had 12,471 participations in total across the two Framework Programmes. In most but not all cases (~10,800) the database included the name and email address of the UK participant. Roughly 40% of these cases related to 'multiple' participations by the same person, so there were in fact 7,869 individuals (or 'participants') who could receive the survey request.

Survey implementation

The questionnaire was uploaded to a professional on-line survey facility in January and final checks and adjustments to formatting were made. On Tuesday 26th January 2010, emails were sent to the 7,869 UK FP6 and FP7 participants that had been identified, with a request to participate in the survey. The deadline for completion of the questionnaire was set at 9th February 2010.

Within the first few hours of the mail-out a number of 'undeliverable' messages were received as well as several 'out of office' messages. In addition, some of the targeted individuals were identified as having already 'opted out' of receiving questionnaires distributed through our on-line survey tool. Taking the undeliverable and 'opt out' messages together, we can estimate that our request failed to reach 1,534 people, leaving us with a pool of possible respondents numbering 6,335.

Response rates were tracked over the period the survey was live and reminder emails were sent one week before the deadline to all of the participants that had not responded to the survey or had not 'opted out' by those dates. The reminder emails restated the importance of the exercise, and encouraged participants to complete the questionnaire by the deadline. The questionnaire was held open for a further three days following the published deadline for receipt of completed questionnaires, after which we proceeded to analyse the results.

Central support function 'participants'

At an early stage in survey implementation, the study team identified a potential issue with some of the FP7 participants listed within the database. Specifically, the job titles for some of the HEI FP7 'participants' suggested that they might be in a central support, rather than a research function (with some consequently listed against 50+ FP7 projects). As the survey was intended primarily for those directly participating in projects and not members of central support offices, the study team sought to ensure that the requests to participate in the survey reached the relevant individuals.

The listed participants suspected of possibly being in central support functions (~280 in total, covering ~1,500 participations) were contacted separately to explain the situation, ask whether they were indeed in a central support function and, if so, if they could forward our request on to the relevant FP7 participants within their organisations and inform the study team of the number of additional contacts targeted. As a result of this request, we are aware that 26 individuals in central support functions forwarded our request onto an additional 423 individuals within their

organisations who were direct participants in FP7 projects. As such, the total number of participants targeted by the survey increased to 6,732[24].

Survey response rates

A total of 1,208 respondents provided a useable questionnaire return, giving an overall response rate of 18% (based on the 6,732 possible respondents). There was also a good level of response from each organisation type (HES, REC, IND, OTH), with at least 70 responses from each main category.

Figure 47 shows the distribution of UK's combined FP6 and FP7 participations by type of organisation and compares this to the distribution of survey responses. It can be seen that the share of responses from industry and research institutes are in line with its overall share of participations, while there is a slightly high response rate from HEIs and a slightly low response rate from "other" organisations. Despite these small differences, the distribution of responses is broadly in line with their overall share of combined FP6 and FP7 participations and we feel able to conclude that the survey responses provide a reliable sample from which to draw conclusions.

Figure 47 – Share of participations and survey responses, by type of organisation

Organisation type	Share of UK's combined FP6 and FP7 participations	Share of responses
HEIs	7,109 (57%)	723 (60%)
Industry[25]	2,444 (20%)	247 (20%)
Research Institutes[26]	1,686 (14%)	168 (14%)
Other[27]	1,154 (9%)	70 (6%)
Total	**12,393 (100%)**	**1,208 (100%)**

Sources: FP6 and FP7 participation data (E-CORDA, December 2010) and Survey of UK participants in FP6/7 (Technopolis, February 2010)

Survey analysis

The database of responses was downloaded from the on-line survey tool and checked prior to analysis. The number of responses received was higher than shown in Figure 47 but a number of respondents were found to have only completed basic information about themselves and had not answered any of the main survey questions. These were removed prior to analysis and are not included in the numbers presented. It is also important to note that some respondents skipped certain questions and so the sample size varies between questions. The *actual* number of respondents providing an answer to a question is used as the basis of calculations within the analysis and is indicated in the heading or final column of the relevant figure (n=x).

When answering the questionnaire, respondents were asked to represent the views of their research group or organisation, as appropriate. Most participants from Universities (HEIs), research institutes and large companies will therefore have answered on behalf of their research group or unit, while participants from small businesses are more likely to have answered from the perspective of their organisation as a whole. Respondents were asked to make their own choice as to what they considered as an appropriate level at which to respond. Finally, respondents were asked to answer from their own personal perspective if they felt unable to talk on behalf of their organisation/group.

The questionnaire data was analysed in order to determine the pattern of responses for each question. In a small number of cases separate analyses was carried out by certain sub-groups of respondents. The main findings from the participant survey are presented in Section 6 of the main report.

[24] A pool of 6,335 possible respondents identified above, minus the 26 central support function individuals identified, plus 423 additional direct participants in receipt of forwarded messages, resulting in 6,732 participants targeted

[25] Referred to as "Private commercial organisations" in FP7 (includes SMEs and large companies)

[26] Includes both, public and private research institutes

[27] Includes those participants whose activity type in FP7 is "Public body"

A.2.5. Interviews with programme officials, national funding bodies and key FP6/7 participants

Interviews with key participants and other relevant actors were undertaken to enable us to deepen our understanding of the impacts of FP participation and the extent to which it has leveraged areas of UK strength, as well as provide a richer and more qualitative perspective than the one revealed through the survey or the desk research alone.

Identification of interviewees

The study team proposed to target two main groups for interview, as follows:

- Key participants, focusing on major national research *performing* institutions (university research groups, research institutes, companies and government agencies), interviewing research directors or equivalents alongside senior researchers with high levels of FP participation. 'Key' academic, industrial and public sectors participants in FP6 and FP7 were selected based mainly on the number, scale and diversity of the actions in which they have been involved. They were identified from the analysis of FP7 participation data, targeting the top 50 institutions overall (but balanced by an analysis of major participants in each of the main collaborative programmes). Efforts were made to include people from a range of different organisation types, ensuring that the most active organisations and individuals from each area were included. Other key participants were identified as necessary as we progressed through the interviews.
- Stakeholders, including: (i) National research funding agencies and their policy leads, again focusing on key individuals with an oversight of national research strengths and the interplay between national priorities and FP, (ii) National delegates responsible for negotiating UK positions in relation to FP work programmes and strategies, and (iii) Government departments with major policy research interests, approaching senior officials from the scientific profession (e.g. chief scientists' groups) and policy teams with a clear interest in policy research to underpin and improve their evidence base. A list of potential stakeholder contacts was compiled from the BIS database of programme managers (lead representatives) and experts, augmented by the study team's wider contacts. The great majority of programme managers identified sit within BIS, while the experts are employed in the main by other government departments and agencies.

The study team (in consultation with BIS) identified an initial list of potential contacts, covering all programmes and areas of FP7, with the exception of nuclear, and most if not all government departments and research councils. The list included ~100 potential interviewees in order to ensure that a target number of 60 interviews across the groups could be met.

Development of interview guides / question sets

Interviews were semi-structured, based around a core set of questions but with sufficient flexibility within the interview process to allow interviewees to focus their inputs on those aspects where they could contribute most. This process also allowed interviewees to introduce other relevant and important issues that might otherwise have been overlooked.

The interview guide followed the same broad structure and covered similar issues as the questionnaire survey, but allowed us to gain a more in-depth qualitative understanding of the main study questions. The core guide is shown in Appendix F , but covers the following main areas:

- The extent to which FPs 4-7 have leveraged areas of UK strength
- The degree of alignment between FP priorities and national strategies and funding
- The extent to which all or only some of the key UK research groups are involved in FPs, and the reasons underlying non-involvement
- The extent to which FPs are supporting gaps in UK funding / capabilities and are helping to strengthen UK research in these areas
- The main impacts of the FPs on UK research capabilities, skills and careers, and mechanisms to enhance the benefits realised
- The main impacts of the FPs on UK industrial development / competitiveness, and mechanisms to enhance the benefits realised
- The main impacts of the FPs on UK policy development and national RTD funding

- The impacts of the FPs on collaboration between UK academic and industrial communities and their counterparts abroad, and the extent of knowledge and technology transfer enabled through these relationships
- The FP mechanisms most strongly associated with positive impacts / benefits and recommendations for enhancing FP alignment and involvement in future

The desk research provided important background to these discussions too, with for example the 'alignment' work revealing several evident cold spots (e.g. limited involvement of major pharma companies) while the composition analyses provided the team with objective data on funding / income across programme areas.

Undertaking interviews and analysis

The study team carried out interviews with 43 individuals in total across the groups, with most individuals (~24) being from major national RTD performing institutions, and the remainder split between the other three groups of stakeholder. Due to the spectrum of views that needed to be consulted and the limited time available, the majority of the interviews were carried out by telephone, but a small number of trips to London and Swindon were also made early on in the study to give the consultation a little more intensity. A full list of contributors is provided in Appendix G .

During the interviews notes were taken, and later transcribed against the standard question set contained in the interview guide. The interview data was then transferred to spreadsheets to support our analysis of the information gained from contributors within a stakeholder group and across different groups. The findings are presented in Section 7.

A.2.6. Analysis and reporting

An interim report was produced in October 2009, two months after the kick-off meeting for the study. This report detailed the progress made up to that point on all of the main components of the workplan and presented preliminary results from the analysis of participation data. The interim report also provided information on progress with the administration of the questionnaire survey and the setting up and carrying out of interviews, as well as early findings from the questionnaire surveys.

Following completion of all data collection and analyses, this draft final report was prepared and submitted on 26 March 2010. It includes all elements set out in the Invitation to Tender, describing the scope and purpose of the study, the methodology employed, and the main findings from our work. Based on a full analysis of all of the data and feedback presented, conclusions and recommendations were developed and are also presented (see Section 8). Specific recommendations have been made in areas where the available evidence suggested that changes or improvements would be both feasible and beneficial. Supporting information is included in a series of appendices.

Following comments from BIS, the report will be finalised and resubmitted for approval.

Appendix B Analysis of UK participation in FP6

B.1. Overall participation in FP6 by UK partners

The overall statistics on UK participation in FP6 are as follows:

- Projects - UK organisations were involved in 4,559 projects, out of a total of 10,058. UK organisations were therefore involved in 45.3% of all FP6 projects
- Participations - The total number of UK participations was 8,792, out of a total of 74,400 for the whole of FP6. The UK's participations therefore constituted 11.8% of the total
- Organisations - A total of 1,845 discrete organisations from the UK participated in FP6, out of an estimated total of 22,615 participants (all countries)[28]. UK organisations therefore constituted ~8.16% of all those involved in FP6
- Funding – UK organisations were allocated a total of €2,369.6 million in funding from FP6, out of a total allocation of €16.7 billion. UK organisations therefore received 14.2% of all FP6 funding

B.2. Performance in FP6 in comparison with previous Framework Programmes

Here we provide a short analysis of how the UK's participation levels in FP6 compare to its participation in the previous Framework Programmes, principally FP5. We also provide comparisons with participation in FP4, but limitations in the data have meant that this has only been possible in relation to the numbers and share of projects with UK participation. Figure 48 below sets out data on the UK's level of involvement in FP projects from FP4 to FP6. The data for FP4 and FP5 is taken from the report '*The Impact of the EU Framework Programmes in the UK*' (July 2004) while the FP6 data was extracted from the E-CORDA database. Figure 48 show that the total numbers of projects supported across the successive programmes has varied, increasing slightly from FP4 to FP5 (up 5%) and then falling sharply from FP5 to FP6 (down 38%). The number of projects with UK involvement fell slightly from FP4 to FP5 (down 9%) and then fell further from FP5 to FP6 (down 31%). The share of projects with UK involvement was highest in FP4 (~47%), falling to ~41% in FP5 and then increasing to ~45% in FP6.

Figure 48 – UK participation in FP4, FP5 and FP6 - projects

Indicator	FP4	FP5	FP6
Number of funded projects	15,457	16,251	10,058
Number of funded projects with UK partners	7,276	6,613	4,559
Share of funded projects with UK partners	47.1%	40.7%	45.3%

Sources: FP4 and FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 - E-CORDA, 1st November 2009

Figure 49 presents data on the numbers of participations in FP5 and FP6 projects, overall and for the UK only. Data on numbers of participations in FP4 projects are not available. The data in Figure 49 shows that UK organisations collectively had 10,905 participations in FP5 projects, out of a total of just over 80,000 (all countries). The UK therefore accounted for 13.6% of all FP5 participations. By comparison, the UK had 8,792 participations in FP6 out of a total of 74,400. The UK's share of FP6 participations was therefore 11.8%, slightly down on its performance in FP5.

[28] The FP6 database suggests that 2,647 UK organisations participated in FP6, but after the data was cleaned this figure was revised (by us) to 1,845, or 69.7 of the 'official' total. The number of organisations involved in FP6 (all countries) was 32,445 and by applying the same adjustment (69,7%), we estimate that the true number of organisations participating in FP6 is 26,615

Figure 49 – UK participation in FP4, FP5 and FP6 - participations

Indicator	FP4	FP5	FP6
Number of project participations	-	80,068	74,400
Number of UK project participations	-	10,905	8,792
UK share of all FP participations	-	13.6%	11.8%

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 - E-CORDA, 1st November 2009

Figure 50 shows the overall amount of funding allocated by the EC under FP5 and FP6 and also shows the volume and share of funding allocated to UK participants. It reveals that the FP budget increased from FP5 to FP6 (up by 30%), as did the volume of funding allocated to UK participants (up 16%). However, as a proportion of all FP funding allocations, the UK share fell from FP5 to FP6 (from 15.9% to 14.2%).

Figure 50 – UK participation in FP4, FP5 and FP6 - funding

Indicator	FP4	FP5	FP6
FP funding allocations, all countries (€m)	-	12,854	16,669
FP funding allocations, UK only (€m)	-	2,047	2,370
UK share of FP budget	-	15.9%	14.2%

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 - E-CORDA, 1st November 2009

Overall, then, looking at the UK's relative performance from FP5 to FP6 the pattern is one of declining number of FP projects and participations (though with a slight increase in UK funding allocations). The UK's project involvement rate increased from FP5 to FP6 in proportionate terms, but its share of participations and funding declined.

B.3. FP6 funding received by UK organisations

B.3.1. Overall funding

As indicated above, UK organisations were allocated a total of €2,370 million in funding from FP6, out of a total allocation of €16.7 billion. UK organisations therefore received 14.2% of all FP6 funding.

The average volume of FP6 funding allocated to UK organisations *per participation* was €269.5k. This is roughly 20% higher than the average for FP6 as a whole (€224k), which explains why the UK's share of FP6 funding (14.2%) was higher than its share of participations (11.8%).

Below we look at FP6 funding to the UK in more detail in order to assess its performance relative to other EU member states.

B.3.2. UK FP6 funding in comparison with other member states

Member states contribute to the Framework Programme budget broadly in line with their share of EU GDP, so in most cases GDP is used as a benchmark for relative performance within the FPs. Figure 51 lists the EU-25 Member States and shows, for each, total FP6 EC funding allocations, share of EU-25 FP6 funding, share of EU-25 GDP, and the ratio of share of EU-25 FP6 funding to share of EU-25 GDP. The table is sorted by the final column, so the countries listed towards the top of the table are those where their share of EU-25 FP6 funding allocations were greater proportionately than their share of EU-25 GDP.

UK's position in the table indicates that it was 18th out of the EU-25 in terms of the amount of FP6 funding realised in comparison with its GDP share. UK's 'target figure' for FP6 income if it were to have been in direct proportion to its GDP contribution to the EU25 total would have been €2,547 million, so there is a notional 'deficit' of ~€177 million in FP6 funding to the UK.

Figure 51 – FP6 funding allocations to the EU-25 in comparison with GDP

Member State	FP6 funding (€ million)	Share of EU-25 FP6 funding	Share of EU-25 GDP (2004)	Ratio FP6 income to GDP
Estonia	34	0.2%	0.1%	242%
Slovenia	76	0.5%	0.3%	196%
Belgium	708	4.7%	2.8%	169%
Sweden	677	4.5%	2.7%	163%
Greece	419	2.8%	1.8%	157%
Netherlands	1,107	7.3%	4.7%	157%
Finland	342	2.3%	1.4%	156%
Malta	10	0.1%	0.0%	155%
Cyprus	28	0.2%	0.1%	151%
Denmark	396	2.6%	1.9%	139%
Austria	424	2.8%	2.2%	126%
Hungary	150	1.0%	0.8%	126%
Latvia	19	0.1%	0.1%	116%
Lithuania	27	0.2%	0.2%	103%
Czech Republic	131	0.9%	0.8%	103%
Germany	3,023	19.9%	21.0%	95%
Ireland	200	1.3%	1.4%	93%
United Kingdom	**2,370**	**15.6%**	**16.8%**	**93%**
France	2,173	14.3%	15.8%	91%
Portugal	171	1.1%	1.4%	82%
Spain	944	6.2%	8.0%	78%
Slovakia	37	0.2%	0.3%	75%
Poland	216	1.4%	1.9%	73%
Italy	1,458	9.6%	13.2%	73%
Luxembourg	22	0.1%	0.3%	56%
EU25	**15,160**	**100.0%**	**100.0%**	**100%**

Sources: FP6 participation data (E-CORDA, 1st November 2009) and Eurostat (GDP data)

Other measures can also be used to 'benchmark' the UK's return from FP6. Below, we provide similar data comparing the share of EU25 FP6 funding to the share of: (i) population, (ii) gross expenditure on research and development (GERD), and (iii) total researchers (FTE).

Figure 52 shows the comparison between FP6 funding and **population** in 2004 for each of the EU-25 Member States. The UK's share of the total EU-25 population was 13%, while its share of FP6 funding amongst the EU-25 was 15.6%. So on this basis the UK's level of return was slightly higher than might have been expected, given its population size.

In fact, the ratio of the UK's share of FP6 funding to its share of population amongst the EU-25 was 120%, placing it ninth out of the EU-25. The UK's target for FP6 income if it were to have been in direct proportion to its share of EU-25 population would have been €1,971 million, so based on this measure the UK achieved almost €399 million more FP6 funding than might have been expected.

Figure 52 – FP6 funding allocations to the EU-25 in comparison with population

Member State	Share of EU-25 FP6 funding	Share of EU-25 Population (2004)	Ratio FP6 income to Population
Sweden	4.5%	2.0%	229%
Denmark	2.6%	1.2%	222%
Netherlands	7.3%	3.5%	206%
Belgium	4.7%	2.3%	206%
Finland	2.3%	1.1%	199%
Austria	2.8%	1.8%	158%
Ireland	1.3%	0.9%	150%
Luxembourg	0.1%	0.1%	148%
United Kingdom	**15.6%**	**13.0%**	**120%**
Slovenia	0.5%	0.4%	116%
Greece	2.8%	2.4%	115%
Cyprus	0.2%	0.2%	115%
Germany	19.9%	18.0%	111%
France	14.3%	13.6%	106%
Italy	9.6%	12.6%	76%
Malta	0.1%	0.1%	76%
Estonia	0.2%	0.3%	76%
Spain	6.2%	9.2%	68%
Portugal	1.1%	2.3%	49%
Hungary	1.0%	2.2%	45%
Czech Republic	0.9%	2.2%	39%
Latvia	0.1%	0.5%	24%
Lithuania	0.2%	0.8%	24%
Slovakia	0.2%	1.2%	21%
Poland	1.4%	8.3%	17%
EU25 (millions)	**€ 15,160**	**459**	

Sources: FP6 participation data (E-CORDA, 1st November 2009) and Eurostat (Population data)

Figure 53 shows the comparison between FP6 funding and **gross expenditure on research & development (GERD)** in 2004 for each of the EU-25 Member States. The UK's contribution towards total EU-25 GERD was 15.46%, while its share of FP6 funding amongst the EU-25 was 15.63%. On this basis the UK's level of return was therefore slightly higher than might have been expected.

The ratio of the UK's share of FP6 funding to its share of GERD amongst the EU-25 was 101%, placing it 20th out of the EU-25. The UK's target for FP6 income, based on its relative level of GERD, would have been €2,344 million, so its FP6 funding 'surplus' was €26 million. Other strong performers in FP6 (France, Germany, Sweden and Finland) all appear below the UK on this measure.

Figure 53 – FP6 funding allocations to the EU-25 in comparison with GERD

Member State	Share of EU-25 FP6 funding	Share of EU-25 GERD (2004)	Ratio FP6 income to GERD
Cyprus	0.18%	0.02%	753%
Malta	0.07%	0.01%	532%
Greece	2.77%	0.53%	523%
Estonia	0.22%	0.04%	520%
Latvia	0.12%	0.02%	508%
Slovakia	0.24%	0.09%	267%
Hungary	0.99%	0.37%	264%
Slovenia	0.50%	0.20%	256%
Lithuania	0.18%	0.07%	251%
Poland	1.42%	0.59%	241%
Portugal	1.13%	0.58%	196%
Belgium	4.67%	2.80%	167%
Netherlands	7.30%	4.54%	161%
Czech Republic	0.86%	0.57%	152%
Ireland	1.32%	0.95%	138%
Spain	6.23%	4.64%	134%
Italy	9.62%	7.91%	122%
Denmark	2.61%	2.54%	103%
Austria	2.79%	2.72%	103%
United Kingdom	**15.63%**	**15.46%**	**101%**
Finland	2.26%	2.72%	83%
Sweden	4.47%	5.40%	83%
France	14.34%	18.50%	77%
Germany	19.94%	28.49%	70%
Luxembourg	0.15%	0.23%	63%
EU25 (millions)	**€ 15,160**	**€ 192,946**	

Sources: FP6 participation data (E-CORDA, 1st November 2009) and Eurostat (GERD data)

Finally, Figure 54 shows the comparison between FP6 funding and the **number of FTE researchers** in 2004 for each of the EU-25 Member States. The UK's contribution towards the total number of researchers in the EU-25 was 14.5%, while its share of FP6 funding amongst the EU-25 was 15.6%. The UK's level of return was therefore 8% higher than might have been expected, given its share of the total number of researchers in the EU-25. This placed the UK 12th out of the EU-25, again ahead of France and Germany. The UK's target for FP6 income, based on its relative number of researchers, would have been €2,198.5 million, so the UK's FP6 funding 'surplus' was €171 million.

Figure 54 – FP6 funding allocations to the EU-25 in comparison with total (FTE) researchers

Member State	Share of EU-25 FP6 funding	Share of EU-25 FTE researchers (2004)	Ratio FP6 income to FTE researchers
Cyprus	0.18%	0.05%	379%
Netherlands	7.30%	3.43%	213%
Greece	2.77%	1.45%*	190%
Malta	0.07%	0.04%	184%
Belgium	4.67%	2.68%	174%
Italy	9.62%	5.95%	162%
Slovenia	0.50%	0.33%	151%
Ireland	1.32%	0.91%	145%
Austria	2.79%	2.14%	130%
Denmark	2.61%	2.16%	121%
Sweden	4.47%	4.03%	111%
United Kingdom	**15.63%**	**14.54%**	**108%**
Germany	19.94%	22.32%	89%
Luxembourg	0.15%	0.17%	87%
France	14.34%	16.71%	86%
Hungary	0.99%	1.23%	80%
Estonia	0.22%	0.28%	80%
Spain	6.23%	8.34%	75%
Finland	2.26%	3.39%	67%
Portugal	1.13%	1.71%	66%
Czech Republic	0.86%	1.35%	64%
Latvia	0.12%	0.27%	45%
Lithuania	0.18%	0.61%	29%
Poland	1.42%	5.03%	28%
Slovakia	0.24%	0.89%	27%
EU25 (millions)	**€ 15,160**	**1.2**	

Sources: FP6 participation data (E-CORDA, 1st November 2009) and Eurostat (FTE data). **A figure for the number of FTE researchers in Greece is unavailable for 2004. An average of 2003 and 2005 figures has been used instead*

Overall the analyses in this section show that the UK has performed reasonably well on established metrics in comparison with other member states, appearing ahead of France and Germany on most of the measures. We can conclude that the UK achieved a good level of financial return from FP6, indicating a strong level of involvement overall, given its size and research intensity.

B.4. FP6 participation by type of organisation

B.4.1. FP6 participations by organisation type

The standard classification of participants in FP6 by organisation (or 'activity') type contains four main categories. Figure 55 compares the breakdown of UK participations by organisation type with the breakdown for all FP6 participations. It should be noted that the figures are known not to be 100% accurate due to variability in the categorisation of organisations, wherein the same organisation is often allocated to several different categories across their various participations. In addition, the organisation type is not specified for 1,010 participations of the overall FP6 figure (78 of the UK participations).

These limitations notwithstanding, the data indicate that the UK's participation profile differs in important respects from that of FP6 as whole. HEIs from the UK account for significantly more of the UK total (56%) than the FP6 average (36%), while UK research institutes account for significantly less than the FP6 average (15% versus 28%). This is not a surprise given the structure of public sector research in the UK as compared to many other EU countries, with the UK's public sector research expenditure concentrated more in HEIs than in research institutes.

UK industry's share of participations was exactly in line with the average for FP6. Participations by 'other' organisations (mainly public sector bodies) from the UK were at a level below the FP6 average (11% for the UK as compared to 17% for FP6 overall). However, it should be noted that we are reporting relative shares here, so the UK HEIs' very high comparative level of involvement means that the other three groups are likely to occupy a smaller share than is the case in other countries where the HEI sector is not as strong.

Figure 55 – Breakdown of UK FP6 participations and all FP6 participations, by type of organisation

Organisation Type	Number (and share) of participations - UK	Number (and share) of participations – FP6 overall
Higher Education	4,871 (56%)	26,490 (36%)
Industry	1,618 (19%)	13,908 (19%)
Research Institutes	1,272 (15%)	20,621 (28%)
Other	953 (11%)	12, 371 (17%)
Total[29]	**8,714 (100%)**	**73,390 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.4.2. FP6 funding by type of organisation

Figure 56 shows the total FP6 funding allocations for UK organisations, by organisation type, and compares these to the breakdown of FP6 funding allocations as a whole.

UK HEIs were allocated a total of €1,409.6 million in funding. This represented 60% of all FP6 funding to UK organisations, a significantly larger share than that obtained by HEIs across FP6 as a whole (37%). UK HEIs received an average of €289k in funding per participation, 25% above the FP6 average of €232k per HEI participation. This means that UK HEIs have not only had a very large number of participations in FP6 they have also had a relatively high level of funding per participation. These factors combine to make UK HEIs far more dominant within the national participant mix than is the case for other countries.

UK industry received €315.7 million in funding. This represented 13% of UK's total, much lower than the share of funding obtained by industry across FP6 as a whole (18%) and well below the share that might be expected given the level of UK industry participation (19% of the UK total). The average amount of funding provided to UK industry per participation was €195k, 10% below the overall FP6 average of €218k per industrial participation. This goes some way to explaining why industry's

[29] The activity type of 78 UK participations and 1,010 participations overall in FP6 are unknown and have therefore been excluded from the table

overall share of UK FP6 funding is relatively low, and indicates that UK companies occupied a more minor role in the projects than industry as a whole, based on this measure at least.

UK research institutes were allocated €448 million in funding. This represented 19% of the UK's total, well below the overall share obtained by research institutes across FP6 as a whole (32%). The average amount of funding per UK research institute participation was €352k, significantly above the overall FP6 average of €253k per research institute participation, so it would appear that UK research institutes have occupied a major role in their FP6 projects. However, the number of UK Research Institute participations is relatively low, due to the dominance of HEIs within the UK's public sector research base.

Other UK participants were allocated €187 million in funding. This represented 8% of the UK's total funding from FP6, significantly lower than the share received by 'other' organisations across FP6 as a whole (13%). The average amount of funding per participation was €196k, 14% above the FP6 average of €172k per participation realised by 'other' organisations across FP6 as a whole.

Figure 56 – UK FP6 funding, by type of organisation

Organisation Type	UK funding allocations (€m)	Total FP6 funding allocations (€m)
Higher Education	1,410 (60%)	6,156 (37%)
Industry	316 (13%)	3,027 (18%)
Research Institutes	448 (19%)	5,221 (32%)
Other	187 (8%)	2,123 (13%)
Total[30]	**2,359 (100%)**	**16,528 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.5. Numbers of UK organisations participating in FP6

Figure 57 shows a breakdown of the number of UK organisations of each type participating in FP6 and compares this to the overall numbers for FP6 as a whole (i.e. all countries). It should be noted that this analysis is based on FP6 participation data that has not been 'cleaned'. As we have indicated above, it is not possible to provide completely accurate figures for the numbers of organisations participating in FP6 because in many cases the same organisation appears under slightly different names within the participation database. This is evident by the fact that the data lists 453 UK HEIs as participating in FP6 when in fact there are not that many HEIs in the UK. While it is possible in theory to 'clean' the organisation names so that they are presented consistently, it has not proved possible within the context of this study to go through all 74,400 records and perform this task.

Figure 57 reveals that HEIs make up 17% of the UK's participant base and 20% of all participants in FP6. Given the much larger than average share of the participations and funding achieved by UK HEIs (as compared to their counterparts in other countries) these figures suggest that the UK HEIs leading position in the FPs is not due to their number but due to other factors, such as their size and their success within the competition.

Industry made up the greatest share (44%) of the UK participant base in FP6, much higher than industry's share of the participant base within FP6 as a whole (30%), even though UK industry achieved only an average share of the participations and a below average share of the funding. These data indicate that the UK's industrial participation in FP6 is characterised by a large number of participants but with a relatively low participation rate and a relatively low volume of funding received. This suggests that UK industry involvement is typically by smaller businesses that occupy a relatively minor role or level of involvement in the programme.

As expected there were relatively few UK Research Institutes involved. They make up just 13% of the UK participant base in FP6, much lower than Research Institute's share of the participant base within FP6 as a whole (24%).

[30] These figures do not include €137 million (€9.7 million in case of UK participations) of funding where the activity type is undefined in the FP6 database

The share of the participant base made up by HEIs within FP6 as a whole is slightly above the equivalent share in the UK, while industrial organisations have substantially lower share of all FP6 participations. This is due to a higher number of research institutes participating in the FP6 than in the case of the UK.

Figure 57 – UK FP6 participants, by type of organisation

Organisation Type	UK organisations	All FP6 organisations
Higher Education	453 (17%)	6,287 (20%)
Industry	1,159 (44%)	9,389 (30%)
Research Institutes	337 (13%)	7,479 (24%)
Other	669 (26%)	8,265 (26%)
Total[31]	**2,618 (100%)**	**31,420 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.5.1. FP6 top 10 participating organisations

In order to find the most frequently participating organisations from the UK within each of the four main organisation types, we cleaned participant names for the *UK data only*. For this purpose we also had to select one organisation type per participant in those cases where multiple organisation types were linked to one participant. This choice was made assuming higher number of correct selections unless there was another sign of organisation type. For example OMNI COMMUNICATIONS LTD had 2 participations as 'other' and one as industry. Its organisation type was therefore corrected to Industry. We have only made corrections to the organisation type of participants where ambiguous selections were made.

Figure 58 lists the top 10 performing organisations in each organisation type based on their number of participations in FP6. University of London, which is a federation of 19 self-governing Colleges, including London School of Economics and Political Science and London Business School, is ranked first with 588 participations. Cambridge University and Oxford University both participated more than 300 times and all of the top 10 UK universities had more than 130 participations. Industry organisations' participations ranged from 38 (Rolls Royce) to 15 (Thales). The top 3 Research Institutes had more than 85 participations each with Medical Research Council leading the table with 113. For 'others', DEFRA and the S&T Facilities Council lead the table with 60 and 58 participations respectively, and the reminding eight participants achieved between 8 and 15 participations each.

[31] These figures do not include participants whose activity type was unidentified and include the respondents who had assigned themselves to multiple activity types

Figure 58 - Top 10 UK Participating organisations in FP6 based on number of participations

Higher Education	Industry	Research Institutes	Other
University Of London[32]	Rolls Royce PLC	Medical Research Council	DEFRA
Cambridge University	BAE Systems LIMITED	Pera Innovation LIMITED	S&T Facilities Council
Oxford University	Airbus UK	Natural Environment Research Council	Department Of Trade And Industry
Imperial College London	BT	TWI LIMITED	Environment Agency
University Of Manchester	QINETIQ LIMITED	John Innes Centre	European Centre For Medium-Range Weather Forecasts
University Of Edinburgh	BP International LIMITED	Health Protection Agency	European Association Of Innovating SMEs
University Of Southampton	Johnson Matthey PLC	Cancer Research UK	Chalex Research LTD
University Of Newcastle Upon Tyne	NEC Europe LTD	Natural History Museum	National Nuclear Corporation LIMITED
University Of Leeds	Unilever UK Central Resources LIMITED	Institute Of Food Research	Engineering And Physical Sciences Research Council
University Of Nottingham	Thales	Fisheries Research Services	Intel Corporation LIMITED

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.6. FP6 participation by Thematic Priority Area

FP6 was made up of three specific programmes, as follows:

1. Integrating and Strengthening the European Research Area
2. Structuring the European Research Area
3. Nuclear Research (Euratom)

The **first specific programme** was split into two main blocks of activities[33], as follows:

Block 1 - Focusing and Integrating European research, which included seven Thematic Priorities and three specific activities covering a wider field of research

- Life sciences, genomics and biotechnology for health
- Information society technologies
- Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices
- Aeronautics and space
- Food quality and safety
- Sustainable development, global change and ecosystems
- Citizens and governance in a knowledge-based society
- Policy support and anticipating scientific and technological needs
- Horizontal research activities involving SMEs
- Specific measures in support of international cooperation

Block 3 – Strengthening the foundations of the European Research Area (ERA), which included two priority areas as follows:

- Support for the coordination of activities
- Support for the coherent development of research & innovation policies

[32] Federation of 19 self-governing Colleges

[33] These were known as Blocks 1 and Blocks 3 – Block 2 formed the second specific programme

The **second specific programme** was formed into one main block of activities, covering four priority areas, as follows:

Block 2 – Structuring the European Research Area (ERA)

- Research and innovation
- Human resources and mobility
- Research infrastructures
- Science and society

The **third specific programme** was organised into a single area, as follows

- Euratom

This gives a total of 17 'priority areas' under which FP6 has been organised, and against which the participation data is reported.

B.6.1. Projects, participations and EC funding, by Priority Area

Figure 59 shows the number of UK projects and participations, and the volume of EC funding allocated, in each of the 17 FP6 Priority Areas.

Due to the differing scales of the different priority areas within FP6 it is not possible to draw conclusions on the performance of UK from this table, but in terms of numbers alone the **Life sciences, genomics and biotechnology**, **Information society technologies**, **Sustainable development** and **Human Resources and mobility** areas were the most significant, with over 380 projects, over 900 participations and in excess of €240 million in funding achieved by the UK in each. The **Human resources and mobility** priority dominated in terms of the number of projects and participations by the UK, closely followed by the **Information society technologies** area, which accounted for the greatest volume of FP6 funding to UK participants.

Figure 59 – UK projects, participations and EC funding, by Priority Area

Priority	Projects	Participations	EC funding (€ million)
1. Life sciences, genomics and biotechnology	388	916	377.62
2. Information society technologies	667	1,500	445.35
3. Nanotechnologies and nanosciences	269	603	175.60
4. Aeronautics and space	166	424	150.04
5. Food quality and safety	121	369	117.52
6. Sustainable development	387	998	241.54
7. Citizens and governance	115	246	35.03
Policy support / S&T needs	338	598	96.52
Horizontal research activities – SMEs	296	765	83.41
Support for international cooperation	103	146	28.46
Research and innovation	88	130	19.52
Human resources and mobility	1,335	1,573	389.24
Research infrastructures	89	185	161.98
Science and society	73	106	8.41
Support for the coordination of activities	60	85	20.17
Development of R & I policies	9	10	1.05
Euratom	55	138	18.17
Total	**4,559**	**8,792**	**2,369.64**

Source: FP6 participation data (E-CORDA, 1st November 2009)

In order to place the raw numbers shown in Figure 59 in context, UK projects, participations and EC funding have been expressed as a share of the FP6 totals for each Priority Area. The results are

shown in Figure 60, and arrows (↑↓↔) have been used to symbolise whether the UK has performed comparatively strongly or less well in each area, as compared to UK's overall performance in FP6. For example, across FP6 as a whole the UK accounted for 11.8% of the participations, so we can say that a participation rate of 12% in the Aeronautics area is 'close to average' (↔) while involvement in 13.4% of Life sciences participations is 'above' average (↑).

The results indicate that the UK has performed above average in terms of its project share in most areas, taking part in over half of the projects in 12 of the 17 priority areas. UK project involvement rates were highest in the **Citizens and governance** (79%), **Euratom** (71%) and **Aeronautics and space** (69%) priorities. These areas tend to be associated with larger projects involving participants from many countries, so the strong performance is in part due to structural reasons.

The share of participations and funding tend to be a better indicator for actual levels of performance. On these two measures UK performance has been strongest in the **Life sciences**, **Policy support**, **Horizontal research activities** (SMEs), and **Human Resources and mobility** actions. In addition, the UK has performed well in terms of funding in the **Food quality and safety** and **Research infrastructures** areas.

Figure 60 – UK projects, participations and EC funding, expressed as a share of FP6 totals, by Priority Area

Priority	Project share	Participation share	EC funding Share
1. Life sciences, genomics and biotechnology	65%↑	13.4%↑	16.3%↑
2. Information society technologies	61%↑	10.5%↓	11.7%↓
3. Nanotechnologies and nanosciences	60%↑	10.3%↓	11.4%↓
4. Aeronautics and space	69%↑	12.1%↔	14.0%↔
5. Food quality and safety	65%↑	11.5%↔	15.6%↑
6. Sustainable development	58%↑	9.5%↓	10.5%↓
7. Citizens and governance	79%↑	12.6%↔	14.4%↔
Policy support / S&T needs	65%↑	13.0%↑	16.0%↑
Horizontal research activities – SMEs	60%↑	14.1%↑	17.6%↑
Support for international cooperation	30%↓	5.8%↓	8.1%↓
Research and innovation	37%↓	7.1%↓	8.6%↓
Human resources and mobility	29%↓	18.6%↑	22.7%↑
Research infrastructures	58%↑	10.0%↓	22.6%↑
Science and society	45%↔	10.3%↓	10.8%↓
Support for the coordination of activities	59%↑	7.1%↓	7.0%↓
Development of R & I policies	47%↑	5.9%↓	7.6%↓
Euratom	71%↑	11.6%↔	9.8%↓
Total	**45.3%**	**11.8%**	**14.2%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

Figure 61 compares the profile of UK participation-level funding in each of the 17 Priority Areas and shows ratios of UK funding per participation compared to others in the same/all projects. It indicates that in most of the Priority Areas UK participants are receiving a higher funding amount on average than their partners in the same projects and than participants in all projects. Overall, UK participants received 15% more funding on average than their partners in the same projects, and 20% more than the average for all participants in all projects.

UK participants in the **Research infrastructures**, **Support for coordination activities**, **Aeronautics & space** and **Food quality & safety** areas received relatively high funding per participation compared to others in same projects. In the **Research infrastructure**, **Support for international cooperation** and **Food quality & safety** areas the volume of funding per UK

participation is also very high compared to others in all projects. These areas are therefore those where the level of UK involvement and / or the scale of the projects in which the UK is involved is much higher than average for those areas, suggesting that the UK partners are taking a major role and / or are participating in the more major projects.

Figure 61 – Comparison of average funding per participation in UK projects and in all projects, by Priority Area (including ratios of UK funding per participation to others in same/all projects)

Priority	Average funding amount per UK participation (UK projects)	Average funding amount per participation (UK projects)	Average funding amount per participation (all projects)	UK funding per participation compared to others in the same projects	UK funding per participation compared to others in all projects
1. Life sciences, genomics and biotechnology	€ 412,248	€ 348,085	€ 339,762	118%	121%
2. Information society technologies	€ 296,901	€ 279,977	€ 265,448	106%	112%
3. Nanotechnologies and nanosciences	€ 291,218	€ 267,088	€ 261,639	109%	111%
4. Aeronautics and space	€ 353,875	€ 255,647	€ 307,429	138% (H)	115%
5. Food quality and safety	€ 318,482	€ 235,232	€ 234,218	135% (H)	136% (H)
6. Sustainable development	€ 242,029	€ 211,772	€ 218,857	114%	111%
7. Citizens and governance	€ 142,396	€ 130,739	€ 124,545	109%	114%
Policy support / S&T needs	€ 161,411	€ 152,592	€ 130,632	106%	124%
Horizontal research activities – SMEs	€ 109,034	€ 90,110	€ 87,083	121%	125%
Support for international cooperation	€ 194,904	€ 153,954	€ 140,067	127%	139% (H)
Research and innovation	€ 150,131	€ 163,641	€ 122,662	92%	122%
Human resources and mobility	€ 247,448	€ 248,210	€ 203,443	100%	122%
Research infrastructures	€ 875,551	€ 423,376	€ 389,897	207% (H)	225% (H)
Science and society	€ 79,359	€ 75,667	€ 75,867	105%	105%
Support for the coordination of activities	€ 237,335	€ 165,666	€ 239,209	143% (H)	99%
Development of R & I policies	€ 105,063	€ 129,131	€ 81,556	81%	129%
Euratom	€ 131,679	€ 149,055	€ 156,692	88%	84%
Total	**€ 269,522**	**€ 233,365**	**€ 224,048**	**115%**	**120%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.7. FP6 participation by Type of Instrument

FP6 employed a range of different types of instruments (projects and actions) to implement its priorities, with a different profile of instruments being used within each Priority Area. The ten instruments employed by FP6 were as follows:

- **Networks of Excellence** (NoEs) – Multipartner projects aimed at strengthening excellence on a research topic by networking the critical mass of resources and expertise around a joint programme of activities. They are aimed primarily at creating a progressive and lasting integration of the research activities of the network partners, while at the same time advancing knowledge on the topic
- **Integrated Projects** (IPs) – Multipartner projects to support objective-driven research, where the primary deliverable is knowledge for new products, processes, services, etc. They should bring together a critical mass of resources to reach ambitious goals aimed either at increasing Europe's competitiveness or at addressing major societal needs
- **Specific Targeted Research Projects** (STREPs) – Multipartner research, demonstration or innovation projects to support research, technological development and demonstration or innovation activities of a more limited scope and ambition, particularly for smaller research actors and participants from candidate countries
- **Coordination Actions** (CAs) – Actions to promote and support the networking and coordination of research and innovation activities. They cover the definition, organisation and management of joint or common initiatives as well as organisation of conferences, meetings, the performance of studies, exchanges of personnel, the exchange and dissemination of good practices, setting up of common information systems and expert groups.
- **Specific Support Actions** (SSAs) – Single or multipartner activities intended to complement the implementation of FP6 and may be used to help in preparations for future Community research policy activities. The actions support conferences, seminars, studies and analyses, working groups and expert groups, operational support and dissemination, information and communication activities, or a combination of these.
- **Co-operative Research Projects** (CRAFT) – Undertaken for the benefit of a number of SMEs from different countries on common specific problems
- **Collective Research Projects** (CLR) – Carried out on behalf of industrial associations or industry groupings in sectors where SMEs are prominent, in order to expand the knowledge base of large communities of SMEs
- **Integrated Infrastructure Initiatives** (I3) – Combine, within a single contract, several activities essential to reinforce research infrastructures and to provide an integrated service at the European level. Covers networking activities, provision of access to transnational users, and joint research activities
- **Specific Actions to Promote Research Infrastructures** (II) – To support the integrated provision of infrastructure related services to the research community at European level, inducing a long-term integrating effect on the way research infrastructures operate, evolve and interact with each other and with their users, thus contributing to the development of the European Research Area
- **Marie Curie Actions (MCAs)** – These actions provide a variety of possibilities for individual researchers in different stages of their career as well as for institutions acting as a host for fellows

B.7.1. Projects, participations and EC funding, by Type of Instrument

Figure 62 shows the numbers of projects and participations, and the volume of EC funding, achieved by UK participants within each of the 10 main types of instrument covered by the FP6 database. As with the Priority Areas, the various instruments were used to a greater or lesser degree across FP6 and so it is not possible to draw firm conclusions on the performance of UK from this table. However, in terms of numbers alone, UK participation was highest for Specific Targeted Research Projects (STREPs), Integrated Projects and Marie Curie Actions, with over 580 projects, over 1500 participations and in excess of €380 million in funding achieved by the UK for each type of instrument.

Figure 62 – UK projects, participations and EC funding, by Type of Instrument

Instrument	Projects	Participations	EC funding (€ million)
Networks of Excellence (NoEs)	168	675	184.58
Integrated Projects (IPs)	585	2,033	875.83
Specific Targeted Research Projects (STREPs)	1,357	2,330	553.16
Coordination Actions (CAs)	349	706	68.90
Specific Support Actions (SSAs)	423	596	82.89
Co-operative Research Projects (CRAFT)	237	578	57.65
Collective Research Projects (CLR)	56	186	25.59
Integrated Infrastructure Initiatives (I3)	8	25	95.72
Specific Actions to Promote Research Infrastructures (II)	45	95	36.57
Marie Curie Actions (MCAs)	1,331	1,568	388.73
Total	**4,559**	**8,792**	**2,369.64**

Source: FP6 participation data (E-CORDA, 1st November 2009)

In order to place the raw numbers shown in Figure 17 in context, UK projects, participations and EC funding have been expressed as a share of the FP6 totals for each Type of Instrument. The results are shown Figure 63, and arrows (↑↔↓) have been used to symbolise whether the UK has performed comparatively strongly or less well for each Type of Instrument, as compared to the UK's overall performance in FP6. For example, across FP6 as a whole the UK participated in 45.3% of the projects, so we can say that a project participation rate of 60% within STREPs is 'above' average (↑) while involvement in 31% of the Specific Support Actions is 'below' average (↓).

The results suggest that the UK has performed comparatively strongly in terms of its share of projects for most types of instruments, being involved in almost all of the Networks of Excellence and Integrated Projects which were typically very large actions involving partners from many countries. For most of the remaining instruments the UK was involved in between half and three-quarters of all the funded projects, meaning that the UK's exposure to the activities and results achieved by FP6 was very significant. In fact, there were only two types of instrument where the UK's involvement rate was below 50% (Marie Curie Actions and Specific Support Actions), both of which typically involve relatively few countries in each project. The ability of any one country to have a high project involvement rate in these instruments is rather low.

The UK's share of the participations and funding associated with each type of instrument is a better indicator of performance, and here we see more variability in the results. The main areas of strong performance were in terms of participations were the Marie Curie Actions, Co-operative research projects and Networks of Excellence, while in terms of funding share the UK has performed best in the Integrated Infrastructure Initiatives, Marie Curie Actions and Co-operative Research Projects.

The UK's relative involvement in Specific Support Actions was rather low across all of the indicators (share of projects, participations and funding).

Figure 63 – UK projects, participations and EC funding, expressed as a share of FP6 totals, by Type of Instrument

Instrument	Project share	Participation share	EC funding share
Networks of Excellence (NoEs)	98%↑	13.1%↑	14.6%↔
Integrated Projects (IPs)	83%↑	11.5%↔	13.2%↔
Specific Targeted Research Projects (STREPs)	60%↑	10.9%↔	12.4%↓
Coordination Actions (CAs)	72%↑	9.9%↓	11.3%↓
Specific Support Actions (SSAs)	31%↓	7.2%↓	8.7%↓
Co-operative Research Projects (CRAFT)	61%↑	15.7%↑	18.0%↑
Collective Research Projects (CLR)	66%↑	11.0%↔	17.3%↑
Integrated Infrastructure Initiatives (I3)	73%↑	7.4%↓	48.2%↑
Specific Actions to Promote Research Infrastructures (II)	54%↑	10.3%↓	10.6%↓
Marie Curie Actions (MCAs)	30%↓	19.2%↑	22.8%↑
Total	**45.3%**	**11.8%**	**14.2%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

There has been a high degree of interest in the new FP6 instruments – NoEs and IPs, and in particular the suitability of these instruments for different groups of actors. Figure 64 shows the profile of involvement of each of the four main groups of participants in each of these two instruments, overall for FP6 and then for the UK only.

The data reveal that overall the participants in **NoEs** are mainly HEIs and research institutes (56% and 29% of the participations respectively). The profile of UK involvement in NoEs shows that most of its involvement has been through the HEI (79%) sector or research institutes (14%), with the remaining participation in NoEs split more evenly between the other two types of organisation. The UK pattern here is therefore fairly typical of the participation profile as a whole except for the fact that the UK has higher involvement by HEIs and lower involvement by Research Institutes.

The Figure also shows that across FP6 as a whole, the **IPs** involve all of the four main participant groups, broadly in proportion, although HEIs pick up a slightly higher share of the participations (31%), and the 'other' category picks up a lower share (15%). Looking at UK involvement in IPs, again the HEIs pick up the largest share, and to a greater extent than was the case overall. The industry's share of participation has remained stable, around 30%, overall and in the case of the UK.

Figure 64 – Profile of involvement in NoEs and IPs, split by organisation type for all FP6 participants and UK only

Instrument	HES	IND	REC	OTH	Total
NoEs – all FP6 participations	56%	8%	29%	7%	**100%**
NoEs – UK only	79%	7%	14%	6%	**100%**
IPs – all FP6 participations	31%	27%	26%	15%	**100%**
IPs – UK only	55%	30%	15%	15%	**100%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.8. Nature of FP6 participation

Participants in the Framework Programmes can occupy the role of project coordinator or are otherwise listed simply as one of the participants. Analysis of the UK's FP6 participations reveals

that the UK partner occupied the role of project coordinator in 1,736[34] cases, or 38% of the projects in which UK participants were involved. This means that the UK participants were in a coordinating role for 20% of all UK FP6 participations, substantially above the FP6 average of 14%.

The total number of projects (with UK involvement and overall) and the total number of projects with UK coordinators is shown in Figure 19 for FP4, FP5 and FP6. Of all projects, the share with a UK coordinator fell from 23.1% in FP4 to 18% in FP5 and then to 17.3% in FP6. As a proportion of just those projects with some UK involvement, a UK coordinator held the position of coordinator in 49% of cases in FP4, 44.1% of cases in FP5 and 38.1% in FP6.

Figure 65 – UK's participation in FP4, FP5 and FP6 - coordinators

Indicator	FP4	FP5	FP6[35]
All projects	15,457	16,251	10,058
Projects with UK partners	7,276	6,613	4,559
Projects with UK coordinators	3,566	2,917	1,736
Share of all projects with a UK coordinator	23.07%	17.95%	17.26%
Share of UK projects with a UK coordinator	49.01%	44.11%	38.08%

Source: '*The Impact of the EU Framework Programmes in the UK* (Technopolis, July 2004; E-CORDA, 1st November 2009)

Patterns of UK coordination by FP6 Priority Area have been analysed, and are shown in Figure 66. It reveals higher than average coordination rates for the UK in the majority of the Priority Areas, particularly in the **Support for international cooperation** and **Development of R&I policies**, where UK coordinator to participation ratios were nearly double the overall FP6 rate. There were no areas of (relatively) low UK coordinator ratios, however in most of the thematic priority areas in Block 1 of the programme UK coordination rates were similar to the FP6 pattern overall.

Figure 66 – UK coordination levels by FP6 Priority Area

Priority	UK coordinators	Coordinator to participant ratio (UK)	Coordinator to participant ratio (FP6 overall)
1. Life sciences, genomics and biotechnology	78	9%↔	9%
2. Information society technologies	106	7%↔	8%
3. Nanotechnologies and nanosciences	47	8%↔	8%
4. Aeronautics and space	25	6%↔	7%
5. Food quality and safety	26	7%↔	6%
6. Sustainable development	63	6%↔	6%
7. Citizens and governance	21	9%↑	7%
Policy support / S&T needs	79	13%↑	11%
Horizontal research activities - SMEs	104	14%↑	9%
Support for international cooperation	35	24%↑	14%
Research and innovation	25	19%↑	13%
Human resources and mobility	1,062	68%↑	54%
Research infrastructures	22	12%↑	8%
Science and society	17	16%↔	16%

[34] Participant's role was not specified in 4 cases
[35] FP6 data is from FP6 database E-CORDA, December 2009

Priority	UK coordinators	Coordinator to participant ratio (UK)	Coordinator to participant ratio (FP6 overall)
Support for the coordination of activities	15	18%↑	8%
Development of R & I policies	2	20%↑	11%
Euratom	9	7%↔	7%
Total[36]	**1,736**	**20%↑**	**14%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

The likelihood of being a project coordinator varies significantly depending on the type of instrument in which organisations are involved. For example, the NoEs have an average of 30 partners and it is therefore relatively difficult to occupy a high share of coordinator roles within this type of instrument. However, Marie Curie actions have an average of only two partners, so we would expect to identify a high share of coordinator roles for this instrument.

Figure 67 presents the number of UK coordinators for each type of instrument and the ratio of UK coordinators to participants. The average FP6 coordinator to participant ratio for each type of instrument is also shown for comparison. Arrows (↑↔↓) have again been used to symbolise whether UK's coordination levels for each type of instrument are above, below, or in line with the overall picture. The data indicate that UK partners have occupied the role of coordinator to a higher degree than the overall FP6 average for most types of instrument, particularly Collective research projects and Integrated infrastructure initiatives.

Figure 67 – UK coordination levels by type of Instrument

Instrument	UK coordinators	Coordinator to participant ratio (UK)	Coordinator to participant ratio (FP6 overall)
Networks of Excellence (NoEs)	23	3%↔	3%
Integrated Projects (IPs)	90	4%↔	4%
Specific Targeted Research Projects (STREPs)	280	12%↔	11%
Coordination Actions (CAs)	69	10↑	7%
Specific Support Actions (SSAs)	100	17%↔	17%
Co-operative Research Projects (CRAFT)	85	15%↑	11%
Collective Research Projects (CLR)	17	9%↑	5%
Integrated Infrastructure Initiatives (I3)	2	8%↑	3%
Specific Actions to Promote Research Infrastructures (II)	12	13%↑	9%
Marie Curie Actions (MCAs)	1,058	67%↑	55%
Total[37]	**1,736**	**20%↑**	**14%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

Analysis of the organisation (activity) type of the UK coordinators revealed that HEIs and research institutes were most likely to fulfil the role of coordinator, occupying the position of coordinator in 33% and 29% of participations respectively. Industry participants were coordinators in 7% of their participations, while for 'other' organisations the figure was 12%.

[36] Participant's role was not specified in 4 cases

[37] Participant's role was not specified in 4 cases

B.9. Collaboration within FP6 projects

B.9.1. Overall extent of collaboration

One of the main objectives of the Framework Programmes is to promote and support collaboration between European and International actors in the research and technological development sphere.

Through their 8,792 participations in 4,559 FP6 projects the UK actors have collaborated with a very large number of other organisations from a very broad range of countries. Overall statistics on the extent of this collaboration are set out below.

B.9.2. Collaboration between UK organisations within FP6 projects

With 8,792 participations across 4,559 projects it is clear that in some cases more than one UK partner was involved in the same FP6 project. In fact, there were 1,884 FP6 projects with more than one UK partner involved (41% of the projects in which the UK was involved). The profile of intra-UK collaboration within the 4,559 projects is shown in Figure 68 below and reveals that in the majority of projects involving UK partners there was no *intra*-UK collaboration (59%). However, there was some level of intra-UK collaboration in 41% of the projects, and in some cases more than ten UK organisations were involved in the same project. These data indicate a good level of intra-UK collaboration within FP6 projects, suggesting that the projects in many cases provide the potential for knowledge transfer between UK organisations as well as between the UK and other countries.

Figure 68 – Number and share of UK FP6 projects with >1 UK partners

UK partners	Number of FP6 projects	Share of FP6 projects
1 (no intra-UK collaboration)	2,675	58.7%
2	894	19.6%
3	435	9.6%
4	238	5.2%
5	129	2.8%
6	76	1.7%
7	43	0.9%
8	24	0.5%
9	10	0.2%
10	18	0.4%
>10	17	0.3%
Total	**4,559**	**100.0%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

We have looked at the extent of intra-UK collaboration within each of the FP6 Priority Areas and found that there have been intra-UK collaborations within all areas. The Priority Areas where the level of intra-UK collaboration was highest (proportionately) were **Euratom** (75%), **Aeronautics and space** (66%), **Food quality and safety** (65%), Hor**izontal research activities involving SMEs** (63%), **Life Sciences and health** (60%), **Sustainable development** (58%) and **ICT** (56%).

B.9.3. Collaboration with actors from different countries

There were 43,032 participations by organisations from other countries in UK FP6 projects, with the partners being drawn from a total of 119 different countries.

Figure 69 presents data on the number and share of participations by actors from other countries within UK projects, listing first the 26 (other) EU Member States, then the current Candidate Countries. In volume terms the greatest number and share of collaborations took place with partners in Germany and France (16% and 12% of collaborations each), followed by Italy (~10%), Spain (~8%) and the Netherlands (~7%). However, this reflects mainly the high levels of participation in FP6 by these countries as a whole.

A better indicator of the strength of collaboration between the UK and other countries is shown in the final column of Figure 69, which expresses the ratio of each country's share of all participations in UK projects to their overall share of FP6 participations. Using this indicator, the most active 'Member State' collaboration partners were Denmark, Ireland, the Netherlands and Sweden and the least active were Romania, Cyprus, Malta and Slovakia.

Figure 69 – UK collaboration with actors from different countries – EU Member States and Candidate countries

Country		Participations in UK projects	Share of all *other* participations in UK projects	Ratio of participation in UK projects to overall level of FP6 participation
EU Member States	Austria	1,155	2.68%	90%
	Belgium	1,961	4.56%	105%
	Bulgaria	261	0.61%	87%
	Cyprus	128	0.30%	83%
	Czech Republic	719	1.67%	102%
	Denmark	1,172	2.72%	109%
	Estonia	220	0.51%	88%
	Finland	956	2.22%	101%
	France	5,376	12.49%	104%
	Germany	6,999	16.26%	102%
	Greece	1,442	3.35%	96%
	Hungary	730	1.70%	94%
	Ireland	628	1.46%	107%
	Italy	4,355	10.12%	101%
	Latvia	125	0.29%	89%
	Lithuania	200	0.46%	89%
	Luxembourg	66	0.15%	97%
	Malta	71	0.16%	86%
	Netherlands	2,840	6.60%	106%
	Poland	1,171	2.72%	95%
	Portugal	804	1.87%	105%
	Romania	319	0.74%	80%
	Slovakia	249	0.58%	86%
	Slovenia	371	0.86%	92%
	Spain	3,278	7.62%	100%
	Sweden	1,849	4.30%	106%
	United Kingdom	-	-	-
Candidate countries	Croatia	82	0.19%	81%
	FYR of Macedonia	17	0.04%	41%
	Turkey	262	0.61%	85%

Source: FP6 participation data (E-CORDA, 1st November 2009)

Figure 70 shows the numbers and share of collaborations with all other (non-member/candidate) countries where the number of participations within UK projects was 40 or more. Switzerland and Norway lead in terms of the number of participations in UK projects, with over 900 participations each. Norway is also one of the most significant collaboration partners (proportionately), the others being South Africa and Iceland. All of them collaborated with the UK at a level at 15% higher than might be expected given their overall levels of participations in FP6.

Figure 70 – UK collaboration with actors from different countries – Other countries with >40 participations in UK projects

	Country	Participations in UK projects	Share of all *other* participations in UK projects	Ratio of participation in UK projects to overall level of FP6 participation
Countries with 30+ participations in UK projects	Argentina	47	0.11%	75%
	Australia	73	0.17%	104%
	Brazil	83	0.19%	82%
	Canada	83	0.19%	100%
	Chile	44	0.10%	97%
	China	243	0.56%	94%
	European Union	170	0.40%	107%
	Iceland	100	0.23%	115%
	India	94	0.22%	105%
	Israel	488	1.13%	98%
	Morocco	51	0.12%	61%
	Norway	986	2.29%	116%
	Russian Federation	281	0.65%	94%
	Serbia & Montenegro	48	0.11%	54%
	South Africa	95	0.22%	116%
	Switzerland	1,338	3.11%	103%
	Tunisia	40	0.09%	55%
	Ukraine	67	0.16%	95%
	United States	188	0.44%	67%

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.9.4. Collaboration between different types of organisation

The partners in the UK FP6 projects breakdown by organisation type as shown in the penultimate column of Figure 71. For comparison, the figure also shows the breakdown of all FP6 participations and all UK participations by organisation type. The spread of UK partners by organisation type is broadly in line with the overall participation rates for FP6 overall, suggesting that while HEIs dominate the UK's involvement profile this has not led to a significantly different pattern of collaboration within the UK projects.

Figure 71 – Partners in UK FP6 projects, by type of organisation

Organisation Type	Participations – UK	Participations in UK projects	Participations – FP6 overall
Higher Education	4,871 (56%)	19,394 (38%)	26,490 (36%)
Industry	1,618 (19%)	9,858 (19%)	13,908 (19%)
Research Institutes	1,272 (15%)	14,196 (28%)	20,621 (28%)
Other	953(11%)	7,829 (15%)	12, 371 (17%)
Total[38]	**8,714 (100%)**	**51,277 (100%)**	**73,390 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

B.10. UK demand for participation in FP6

This section looks out UK participation in proposals submitted to FP6, using the available data to gauge levels of demand and success rates within the competition.

[38] The activity type of 78 UK participations and 1,010 participations overall in FP6 are unknown and have therefore been excluded from the totals

B.10.1. Proposals submitted to FP6 with UK participation

BIS provided a database containing information on UK participation in proposals submitted to FP6. There were 40,724 records in the database on receipt, including 944 records with missing data on project title.

The number of discrete proposals in which UK applicants were named was calculated as 22,333. Data published by the Commission indicates that the total number of proposals submitted to FP6 was 55,597, so we can calculate that UK's participation rate within the proposals was 40.2%. This is an indicator of the level of 'demand' for participation in FP6 by UK organisations.

Figure 72 shows the breakdown of FP6 proposals with UK involvement, by priority area. In terms of numbers alone, proposals with UK participation were most numerous in the **Human resources and mobility** and **Information society technologies** areas, with over 4,300 proposals in each case.

The Figure also shows the breakdown of *all* FP6 proposals by Priority Area. By comparing all proposals with those with UK participation, the final column gives an indication of the *relative* level of demand for involvement in each area. It shows that the UK's proposal participation rate was highest in proposals submitted to the **Citizens and governance**, **Sustainable development**, **Nanotechnology** and **IST** priority areas. UK participation rates were lowest in **Support for international cooperation**, **Human resources and mobility**, **Science and Society** and **Euratom** areas.

Figure 72 – UK's participation in FP6 proposals, by Priority Area

Priority	All proposals	UK proposals	Demand - share of bids with UK involvement
1. Life sciences, genomics & biotechnology	2,442	1,244	51%
2. Information society technologies	7,627	4,313	57%
3. Nanotechnologies and nanosciences	2,810	1,628	58%
4. Aeronautics and space	805	450	56%
5. Food quality and safety	1,145	563	49%
6. Sustainable development	2,763	1,598	58%
7. Citizens and governance	886	634	72%
Policy support / S&T needs	2,745	1,351	49%
Horizontal research activities – SMEs	3,980	1,871	47%
Support for international cooperation	2,759	655	24%
Research and innovation	762	288	38%
Human resources and mobility	23,464	6,774	29%
Research infrastructures	514	239	46%
Science and society	1,406	407	29%
Support for the coordination of activities	241	100	41%
Development of R & I policies	140	54	39%
Euratom	321	103	32%
Unassigned	0	61	-
Total	**55,957**	**22,333**	**40%**

Source: FP6 proposal data (BIS, December 2009)

Figure 73 shows the breakdown of FP6 proposals with UK participation, by **type of instrument**, and gives an indication of the relative level of demand for involvement in each type.

In terms of numbers alone, proposals with UK participation were highest for Marie Curie Actions, Specific Targeted Research Projects (STREPs) and Specific Support Actions, with over 6,900 proposals for each type of instrument. The figure also shows that the UK's proposal participation rate was highest in proposals submitted in relation to Networks of Excellence, Integrated Projects, Coordinated Actions and STREPs.

Figure 73 – UK's participation in FP6 proposals, by Type of Instrument

	All proposals	UK proposals	Demand – share of bids with UK involvement
Networks of Excellence (NoEs)	871	744	85%
Integrated Projects (IP)	3,915	2,397	61%
Coordination Actions (CA)	1,931	1,096	57%
SME-specific projects (CRAFT & CLR)	3,954	1,852	47%
Specific Targeted Research Projects (STREPS)	14,411	7,424	52%
Specific Support Actions (SSA)	6,915	1,799	26%
Marie Curie Actions (MCA)	23,318	6,767	29%
Other (I3, II, OSA)	642	253	39%
Unassigned	*0*	*1*	-
Total	**55,957**	**22,333**	**40%**

Source: FP6 proposal data (BIS, December 2009)

In 20% of proposals with a UK participant, the **role of coordinator** was assigned to a UK participant. Of *all participations in* proposals, a UK participant held the role of coordinator in 2.1% of cases.

B.10.2. UK participations in proposals submitted to FP6

The number of UK *participations* in FP6 proposals was calculated as 40,724. The Commission data[39] indicates that there was a total of 389,737 participations in all of the submitted proposals received under FP6, so the UK's share of the participations in proposals is calculated as 10.4%. This is an indicator of the level of 'demand' for participation in FP6 by UK organisations.

Figure 74 shows the breakdown of UK participations in FP6 proposals by type of organisation and gives an indication of the relative level of demand for involvement by each type. The data shows that HEIs from the UK account for the greatest proportion (55%) of participations in proposals. Participations from Industry and Research Institutes accounted for 22% and 14% respectively. The remainder (15%) of participations in proposals were from 'other' types of organisations.

Figure 74 – UK participation in FP6 proposals, by type of organisation

Organisation Type	Number of UK participations	Share of all UK participations
Higher Education	21,818	55%
Industry	8,743	22%
Research Institutes	5,639	14%
Other	3,693	9%
Total[40]	**39,960**	**100%**

Source: FP6 proposal data (BIS, December 2009) *Note that organisation type is unknown in 1010 cases

[39] This data includes both, eligible and ineligible applications

[40] The figure does not include 764 UK participations in proposals where the organisation type is not specified

B.11. UK success rates in applying to FP6

As indicated above, UK organisations participated in 22,333 FP6 proposals and in 4,559 FP6 projects, so UK's overall project-level success rate was 20.5%, significantly above the average success rate for FP6 as a whole, which was 18.0%. This indicates that proposals with UK participation have performed well overall.

B.11.1. UK success rates by FP6 Priority Area

Figure 75 shows the success rates of proposals with UK participation and compares these to the overall success rates for all proposals submitted to FP6, by FP6 Priority Area. It shows that UK proposal success rates were above the FP6 average in 16 of the 17 Priority Areas (Research and Innovation had a slightly lower success rate than FP6 average), with the UK performing particularly well in the following areas, where UK success rates were more than 50% higher than the FP6 averages: Euratom; Coordination of activities; Policy support for S&T; Science and society; Food quality and safety

Figure 76 shows the same analysis but for UK *participations* in proposals. It reveals that the UK participation-level success rates were above the FP6 averages in 14 out of 17 Priority areas (ICT, Research Infrastructures and Development of R&I policies were below the average). The UK has performed particularly well in the following areas where its participation-level success rates were more than 25% higher than the FP6 averages: Euratom; Horizontal research activities – SMEs; Aeronautics and Space; Life Sciences; Science and society; Sustainable development.

Figure 75 – UK and all FP6 proposal success rates by Priority Area

Priority	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP6	Ratio of UK success rates to FP6 success rates
1. Life sciences, genomics & biotechnology	1,244	388	31%	24.5%	127%
2. Information society technologies	4,313	667	15%	14.3%	108%
3. Nanotechnologies and nanosciences	1,628	269	17%	15.8%	104%
4. Aeronautics and space	450	166	37%	29.9%	123%
5. Food quality and safety	563	121	21%	16.2%	133%
6. Sustainable development	1,598	387	24%	24.0%	101%
7. Citizens and governance	634	115	18%	16.5%	110%
Policy support / S&T needs	1,351	338	25%	19.0%	132%
Horizontal research activities – SMEs	1,871	296	16%	12.3%	129%
Support for international cooperation	655	103	16%	12.4%	127%
Research and innovation	288	88	31%	31.1%	98%
Human resources and mobility	6,774	1,335	20%	19.5%	101%
Research infrastructures	239	89	37%	30.0%	124%
Science and society	407	73	18%	11.5%	157%
Support for the coordination of activities	100	60	60%	42.3%	142%
Development of R & I policies	54	9	17%	13.6%	123%
Euratom	103	55	53%	24.3%	220%
Unassigned	61	0	-	-	-
Total	**22,333**	**4,559**	**20%**	**18.0%**	**114%**

Source: FP6 proposal data (BIS, December 2009)

Figure 76 – UK and all FP6 participation-level success rates by Priority Area

Priority	UK participations in proposals	UK participations in projects	Participation success rate - UK	Participation success rate – all FP6	Ratio of UK success rates to FP6 success rates
1. Life sciences, genomics & biotechnology	2,825	916	32%	25.4%	128%
2. Information society technologies	8,393	1,500	18%	18.4%	97%
3. Nanotechnologies and nanosciences	3,972	603	15%	14.7%	103%
4. Aeronautics and space	924	424	46%	36.1%	127%
5. Food quality and safety	1,380	369	27%	22.0%	121%
6. Sustainable development	3,656	998	27%	21.9%	125%
7. Citizens and governance	1,239	246	20%	17.4%	114%
Policy support / S&T needs	2,173	598	28%	23.4%	118%
Horizontal research activities – SMEs	4,698	765	16%	11.4%	143%
Support for international cooperation	886	146	16%	14.5%	113%
Research and innovation	428	130	30%	28.6%	106%
Human resources and mobility	8,487	1,573	19%	15.9%	116%
Research infrastructures	557	185	33%	37.8%	88%
Science and society	592	106	18%	14.1%	127%
Support for the coordination of activities	130	85	65%	52.9%	124%
Development of R & I policies	68	10	15%	15.7%	94%
Euratom	174	138	79%	51.1%	155%
Unassigned	142	-	-	-	-
Total	**40,724**	**8,792**	**22%**	**19.1%**	**113%**

Source: FP6 proposal data (BIS, December 2009)

B.11.2. UK proposal success rates by instrument

Figure 77 shows the success rates of proposals with UK participation and compares these to the overall success rates for all proposals submitted to FP6, by instrument. It shows that UK proposal success rates were above the FP6 average for all 8 main categories of instrument, with the UK performing particularly well in relation Integrated Projects, SME-specific actions and infrastructure projects.

Figure 77 – UK and all FP6 proposal success rates by Instrument

	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP6	Ratio of UK success rates to FP6 success rates
Networks of Excellence (NoEs)	744	168	23%	19.6%	115%
Integrated Projects (IP)	2,397	585	24%	18.0%	136%
SME-specific projects (CRAFT & CLR)	1,852	293	16%	12.0%	131%
Specific Targeted Research Projects (STREPS)	7,424	1,357	18%	15.8%	116%
Specific Support Actions (SSA)	1,799	423	24%	19.8%	119%
Marie Curie Actions	6,767	1,331	20%	19.2%	102%
Coordinated Actions (CA)	1,096	349	32%	25.2%	127%
Other (I3, II, OSA)	253	53	21%	14.8%	142%
Unassigned	1	0	-	-	-
Total	**22,333**	**4,559**	**20%**	**18%**	**114%**

Source: FP6 proposal data (BIS, December 2009)

B.11.3. UK proposal success rates by type of organisation

As indicated above, there were 40,727 UK participations in FP6 *proposals* and 8,792 UK participations in FP6 *projects*. The UK success rate at the level of participations was therefore 22%. This is higher than the success rate for FP6 participations overall (19%).

Figure 78 shows the success rates of UK participations in proposals submitted to FP6, by the four different organisation types. It suggests that success rates were highest amongst participations from 'other' (26%) organisations and Research Institutes (23%), followed closely by Higher Education (22%), while success rates for participations from Industry (19%) were lower.

Figure 78 – UK FP6 proposal success rates by type of organisation

	UK participations in proposals	UK participations in projects	UK Participation Success rates
Higher Education	21,818	4,871	22%
Industry	8,742	1,618	19%
Research Institutes	5,639	1,272	23%
Other	3,693	953	26%
Total[41]	**40,724**	**8,792**	**22%**

Source: FP6 proposal data (BIS, December 2009)

[41] Figures include 831 FP6 participations in proposals and 78 UK participations in proposals where the organisation type is not specified

B.12. Comparing UK participation and success rates in FP6

The two columns of Figure 26 present the data on UK participation rates and success rates by priority area in FP6, relative to FP6 rates overall. These 'success ratios' have already been presented in Figure 76 but have this time been normalised to total 100%. This will allow better comparisons with the participation ratios, which naturally total 100%. Each cell is marked as 'low', 'medium' or 'high' depending on the rank within the UK ratios, with the top 6 priorities in 'high', 7th-11th in 'medium' and reminding 6 priorities in the 'low' category. For example, the share of UK participation accounted for by the *Research Infrastructures* priority area ranked 12th and therefore is in the 'low' category.

UK participations have above average participation rates and success rates in **Life sciences, genomics & biotechnology**, **Aeronautics and space** and **Horizontal research activities** (for benefit of SMEs). Even though UK's success rates are 'medium' in Hum**an resources and mobility**, **Citizens and governance**, and **Policy support/S&T needs**, they are above FP6 averages and with significantly higher participation rates we can say that they are areas of strong UK performance. The combination of high participation rates and above average success rates suggests high implied demand for these areas.

The UK has relatively low participation rates in **Sustainable development**, **Support for international cooperation**, **Research and innovation**, **Research Infrastructures**, **Support for the coordination of activities** and **Development of R & I policies**. While the UK has also got low success rates for all of these priority areas except Research infrastructures, the demand for participation in proposals is expected to be quite low.

Figure 79 – Levels of UK demand: a comparison between UK' relative success and participation rates in FP6

Priority	UK participation success ratio (SR) (Ratio of UK to FP6 success rates)	UK participation ratio (PR) (Ratio of UK to FP6 participation rates)
1. Life sciences, genomics & biotechnology	High (113%)	High (114%)
2. Information society technologies	Low (86%)	Medium (89%)
3. Nanotechnologies and nanosciences	Low (91%)	Medium (87%)
4. Aeronautics and space	High (112%)	High (103%)
5. Food quality and safety	Medium (107%)	Medium (97%)
6. Sustainable development	High (110%)	Low (81%)
7. Citizens and governance	Medium (101%)	High (107%)
Policy support / S&T needs	Medium (104%)	High (110%)
Horizontal research activities - SMEs	High (126%)	High (119%)
Support for international cooperation	Low (100%)	Low (49%)
Research and innovation	Low (94%)	Low (60%)
Human resources and mobility	Medium (103%)	High (158%)
Research infrastructures	Low (78%)	Low (85%)
Science and society	High (112%)	Medium (88%)
Support for the coordination of activities	Medium (109%)	Low (60%)
Development of R & I policies	Low (83%)	Low (50%)
Euratom	High (137%)	Medium (99%)
Total	100%	100%

Sources: Derived from FP6 participation data and FP6 proposal data (E-CORDA, 1st November 2009)

Appendix C Analysis of UK participation in FP7

C.1. Introduction

The results of our analysis of UK participation in FP7 (to date) are presented below under a number of sub-headings. It is important to note that we are not yet mid-way through FP7 and the participation database covers only those contracts signed and registered centrally by 15th October 2009 (therefore just less than three years of the six-year programme). As a result, the number of participations in FP7 and the volume of funding assigned at this stage are significantly lower than the totals for FP6.

C.2. Overall participation in FP7 by UK organisations

The overall statistics on UK participation in FP7 are as follows:

- Projects - UK organisations have been involved in 2,204 projects, out of a total of 5,105. UK organisations have therefore been involved in 43.2% of all FP7 projects
- Participations - The total number of UK participations is 3,679, out of a total of 30,518 for FP7 to date. The UK's participations therefore constitute 12.1% of the total
- Organisations - A total of 868 discrete organisations from the UK have participated in FP7, out of an estimated[42] total of 9,893 participants (all countries). UK organisations therefore constituted ~8.77% of all those involved in FP7
- Funding – UK organisations have been allocated a total of €1.348 billion in funding from FP7, out of a total allocation of €9.2 billion. UK organisations have therefore received 14.6% of all FP7 funding

C.3. Performance in FP7 in comparison with previous Framework Programmes

Here we provide a short analysis of how the UK's participation levels in FP7 (to date) compare to its participation in the previous Framework Programmes, principally FP5 and FP6. As indicated above, because FP7 is still underway, the 'shares' achieved by the UK are much more relevant than the absolute values of participations, projects and funding.

Figure 80 below sets out data on the UK's level of involvement in FP projects from FP5 to FP7. The data show that the share of all FP projects in which the UK is participating continues to fluctuate at around the 40% - 45% level. In FP7 to date the share of projects with UK involvement is slightly below the FP6 level but higher than that realised in FP5. This confirms that the UK continues to play a significant and active role in the Framework Programmes.

Figure 80 – UK participation in FP5, FP6 and FP7 - projects

Indicator	FP5	FP6	FP7 (to date)
Number of funded projects	16,251	10,058	5,105
Number of funded projects with UK partners	6,613	4,559	2,204
Share of funded projects with UK partners	40.7%	45.3%	43.2%

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

Figure 81 presents data on the numbers of participations in FP5, 6 and 7 projects, overall and for the UK only. The data shows that UK organisations collectively have had 3,679 participations in FP7 projects to date, out of a total of 30,518 (all countries). The UK therefore accounted for 12.1% of all

[42] The FP7 database suggests that 900 UK organisations participated in FP7, but after the data was cleaned this figure was revised (by us) to 868, or 96.44% of the 'official' total. The number of organisations involved in FP7 (all countries) was 10,258 and by applying the same adjustment (96,44%), we estimate that the true number of organisations participating in FP7 is 9,893.

FP7 participations, a slightly higher share than achieved in FP6 (11.8%) but below the level achieved in FP5 (13.6%).

Figure 81 – UK participation in FP5, FP6 and FP7 - participations

Indicator	FP5	FP6	FP7
Number of project participations	80,068	74,400	30,518
Number of UK project participations	10,905	8,792	3,679
UK share of all FP participations	13.6%	11.8%	12.1%

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

Figure 82 shows the overall amount of funding allocated by the EC under FP5, FP6 and FP7 (to date) and also shows the volume and share of funding allocated to UK participants. It reveals that at this stage UK participants have achieved almost €1.35 billion in EC funding, a 14.6% share of all FP7 funding to date. This is higher than the share of EC funding achieved in FP6 (14.2%) but below the share achieved in FP5 (15.9%).

Figure 82 – UK participation in FP5, FP6 and FP7 - funding

Indicator	FP5	FP6	FP7
FP funding allocations, all countries (€m)	12,854	16,669	9,216
FP funding allocations, UK only (€m)	2,047	2,370	1,348
UK share of FP budget	15.9%	14.2%	14.6%

Sources: FP5 - 'The Impact of the EU Framework Programmes in the UK (Technopolis, July 2004); FP6 and FP7 - E-CORDA, 1st November 2009

Overall, then, looking at the UK's relative performance from FP5 to FP6 to FP7 the pattern is one of declining share of FP participations and funding from FP5 to FP6 but an increased share from FP6 to FP7. A comparison of the relative performance of the UK, France and Germany across successive FPs indicates that:

- The UK has continued to maintain its leading position in terms of the numbers of FP projects in which it was involved (ranked first in FP5, FP6 and FP7)
- The UK was ranked first in terms of numbers of participations in FP5[43], but was overtaken by Germany in FP6 and is still ranked second behind Germany during the first part of FP7. However, the gap between the two countries appears to be closing
- The UK was ranked second behind Germany in terms of total volume of FP funding received in FP6, and remains so during the first part of FP7. However, as with numbers of participations the gap between the two countries appears to be closing with respect to the relative share of FP funding

C.4. FP7 funding received by UK organisations

C.4.1. Overall funding

The total budget for FP7 is €50.5 billion, covering the period 2007-13[44]. It is important to note that, because FP7 is ongoing, the data used for the analysis of FP7 participation to date includes just €9.2 billion of funding allocations, equivalent to 18.2% of the total budget for FP7 as a whole.

[43] The data is not 100% reliable so has not been presented in this report

[44] Amended proposal for a Decision of the European Parliament and of the Council, concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007-13), COM(2005) 119 final/2

The average volume of FP7 funding allocated to each UK participant is €1.553 million. Across FP7 as a whole, the average amount of funding per participant is estimated at around €931k, so UK organisations have received 67% more FP7 funding than the average participant.

The average volume of FP7 funding allocated to UK organisations per *participation* has been €366k to date. This is more than 20% above the average for FP7 as a whole (€302k).

C.4.2. UK FP7 funding in comparison with other member states

The UK's 'return' from FP7 to date is €1.348 billion, or 14.6% of the total EC funding allocation for FP7 as a whole over this period. In 2007, the UK's share of EU GDP (out of the 27 Member States) was 16.5%, so on this basis the UK's level of return is slightly below the level that might be hoped for.

Figure 83 lists the EU-27 Member States and shows, for each, total FP7 EC funding allocations, share of EU-27 FP7 funding, share of EU-27 GDP, and the ratio of share of EU-27 FP7 funding to share of EU-27 GDP. The table is sorted by the final column so that the countries listed towards the top of the table are those where their share of EU-27 FP7 funding allocations is greater proportionately than their share of EU-27 GDP.

The UK's position in the table (with a ratio of 99%) indicates that it is 13th out of the EU-27 in terms of the amount of FP7 funding realised in comparison with its share of GDP. The UK's 'target figure' for FP7 income if it were to have been in direct proportion to its GDP contribution would have been €1,362.1 million, so the UK's deficit equates to ~€13.8 million in FP7 funding.

Based on results so far, the UK's FP income to GDP ratio has increased from 93% in FP6 (with 25 Member States) to 99% in FP7 (with 27 Member States). It has also moved five places up the table, from 18th to 13th.

Figure 83 – FP7 funding allocations to the EU-27 – GDP comparison

Member State	FP7 funding (€ million)	Share of EU-27 FP7 funding	Share of EU-27 GDP (2007)	Ratio FP7 income to GDP
Estonia	24.9	0.3%	0.1%	239%
Finland	227.7	2.8%	1.5%	190%
Slovenia	42.2	0.5%	0.3%	183%
Sweden	387.3	4.7%	2.7%	175%
Greece	243.5	3.0%	1.8%	161%
Belgium	350.7	4.3%	2.7%	157%
Netherlands	595.2	7.2%	4.6%	157%
Bulgaria	28.6	0.3%	0.2%	149%
Cyprus	15.4	0.2%	0.1%	147%
Malta	5.2	0.1%	0.0%	142%
Austria	247.2	3.0%	2.2%	137%
Denmark	202.2	2.5%	1.8%	134%
United Kingdom	**1348.3**	**16.4%**	**16.5%**	**99%**
Hungary	66.2	0.8%	0.8%	98%
Germany	1527.5	18.5%	19.6%	94%
France	1143.8	13.9%	15.3%	91%
Czech Republic	74.6	0.9%	1.0%	88%
Portugal	95.2	1.2%	1.3%	88%
Spain	534.4	6.5%	8.5%	76%
Italy	782.9	9.5%	12.5%	76%
Ireland	96.0	1.2%	1.5%	76%
Latvia	9.7	0.1%	0.2%	69%
Lithuania	11.2	0.1%	0.2%	59%
Slovakia	19.0	0.2%	0.4%	52%
Poland	105.2	1.3%	2.5%	51%
Luxembourg	12.5	0.2%	0.3%	50%
Romania	40.9	0.5%	1.0%	49%
EU-27	**8237.6**	**100.0%**	**100.00%**	**100%**

Source: FP7 participation data (E-CORDA, 1st November 2009) and Eurostat (GDP data)

If we look at the ratio of the share of FP7 funding realised to the share of the **population** in 2007 (Figure 84), then the UK (with a ratio of 133%) is getting a level of return well above what might be expected based on its population size, and would be placed 9th out of the EU-27 on this measure. Based on results so far, the UK's FP income to population ratio has risen from 120% in FP6 to 133% in FP7 and it has also moved up three places, from 12th to 9th.

Figure 84 – FP7 funding allocations to the EU-27 – population comparison

Member State	FP7 funding (€ million)	Share of EU-27 FP7 funding	Share of EU-27 Population (2007)	Ratio FP7 Income to Pop
Finland	227.7	2.76%	1.07%	259%
Sweden	387.3	4.70%	1.84%	256%
Denmark	202.2	2.45%	1.10%	223%
Netherlands	595.2	7.22%	3.30%	219%
Belgium	350.7	4.26%	2.14%	199%
Austria	247.2	3.00%	1.67%	179%
Luxembourg	12.5	0.15%	0.10%	158%
Ireland	96.0	1.16%	0.87%	134%
United Kingdom	**1,348.3**	**16.37%**	**12.28%**	**133%**
Greece	243.5	2.96%	2.26%	131%
Slovenia	42.2	0.51%	0.41%	126%
Cyprus	15.4	0.19%	0.16%	119%
Germany	1,527.5	18.54%	16.62%	112%
Estonia	24.9	0.30%	0.27%	111%
France	1,143.8	13.88%	12.85%	108%
Italy	782.9	9.50%	11.94%	80%
Malta	5.2	0.06%	0.08%	76%
Spain	534.4	6.49%	8.98%	72%
Portugal	95.2	1.16%	2.14%	54%
Czech Republic	74.6	0.91%	2.08%	44%
Hungary	66.2	0.80%	2.03%	40%
Latvia	9.7	0.12%	0.46%	25%
Bulgaria	28.6	0.35%	1.55%	22%
Slovakia	19.0	0.23%	1.09%	21%
Lithuania	11.2	0.14%	0.68%	20%
Poland	105.2	1.28%	7.70%	17%
Romania	40.9	0.50%	4.35%	11%
EU-27	**8,237.6**	**100.00%**	**100.00%**	**100%**

Source: FP7 participation data (E-CORDA, 1st November 2009) and Eurostat (Population data)

If we look at the ratio of share of FP7 funding realised to share of **GERD** (Figure 85), then the UK (with a ratio of 102%) would be placed 20th out of the EU-27. Based on results so far, the UK's FP income to GERD ratio has therefore slightly increased from 101% in FP6, meaning that it is still achieving a rate of return that is higher than we might have expected based on this measure. It kept its 20th place (out of 25 in FP6 and out of 27 in FP7).

Figure 85 – FP7 funding allocations to the EU-27 – GERD comparison

Member State	FP7 funding (€ million)	Share of EU-27 FP7 funding	Share of EU-27 GERD (2007)	Ratio FP7 Income to GERD
Cyprus	15.4	0.19%	0.03%	609%
Bulgaria	28.6	0.35%	0.06%	568%
Greece	243.5	2.96%	0.58%	514%
Malta	5.2	0.06%	0.01%	439%
Estonia	24.9	0.30%	0.08%	396%
Slovenia	42.2	0.51%	0.22%	233%
Latvia	9.7	0.12%	0.06%	213%
Slovakia	19.0	0.23%	0.11%	208%
Hungary	66.2	0.80%	0.43%	187%
Romania	40.9	0.50%	0.29%	173%
Netherlands	595.2	7.22%	4.24%	170%
Poland	105.2	1.28%	0.77%	165%
Belgium	350.7	4.26%	2.75%	155%
Portugal	95.2	1.16%	0.84%	137%
Lithuania	11.2	0.14%	0.10%	133%
Italy	782.9	9.50%	7.39%	129%
Spain	534.4	6.49%	5.86%	111%
Ireland	96.0	1.16%	1.10%	106%
Czech Republic	74.6	0.91%	0.86%	106%
United Kingdom	**1,348.3**	**16.37%**	**16.12%**	**102%**
Finland	227.7	2.76%	2.74%	101%
Austria	247.2	3.00%	3.05%	98%
Denmark	202.2	2.45%	2.54%	97%
Sweden	387.3	4.70%	5.24%	90%
France	1,143.8	13.88%	17.28%	80%
Germany	1,527.5	18.54%	27.01%	69%
Luxembourg	12.5	0.15%	0.26%	59%
EU-27	**8,237.6**	**100.00%**	**100.00%**	**100%**

Source: FP7 participation data (E-CORDA, 1st November 2009) and Eurostat (GERD data)

If we look at the ratio of share of FP7 funding realised to share of the total **number of FTE researchers** (Figure 86), then the UK (with a ratio of 126%) would be placed 10th out of the EU-27. Based on results so far, the UK's FP income to researcher ratio has therefore increased from 108% in FP6 to 126% in FP7. It has also gained two places from 12th (out of 25 in FP6) to 10th (out of 27 in FP7).

Figure 86 – FP7 funding allocations to the EU-27 – FTE researcher comparison

Member State	FP7 funding (€ million)	Share of EU-27 FP7 funding	Share of EU-27 FTE (2007)	Ratio FP7 income to FTE
Cyprus	15.4	0.19%	0.06%	316%
Netherlands	595.2	7.22%	3.28%	220%
Greece	243.5	2.96%	1.55%	191%
Malta	5.2	0.06%	0.04%	163%
Belgium	350.7	4.26%	2.67%	159%
Italy	782.9	9.50%	6.57%	145%
Sweden	387.3	4.70%	3.55%	132%
Austria	247.2	3.00%	2.33%	129%
Ireland	96.0	1.16%	0.90%	129%
United Kingdom	**1,348.3**	**16.37%**	**13.04%**	**126%**
Denmark	202.2	2.45%	2.20%	112%
Slovenia	42.2	0.51%	0.46%	110%
Estonia	24.9	0.30%	0.27%	110%
Finland	227.7	2.76%	2.90%	95%
Luxembourg	12.5	0.15%	0.16%	94%
France	1,143.8	13.88%	15.69%	89%
Germany	1,527.5	18.54%	21.12%	88%
Spain	534.4	6.49%	9.11%	71%
Hungary	66.2	0.80%	1.29%	62%
Portugal	95.2	1.16%	2.08%	56%
Czech Republic	74.6	0.91%	2.07%	44%
Bulgaria	28.6	0.35%	0.83%	42%
Latvia	9.7	0.12%	0.31%	37%
Romania	40.9	0.50%	1.40%	36%
Poland	105.2	1.28%	4.56%	28%
Slovakia	19.0	0.23%	0.92%	25%
Lithuania	11.2	0.14%	0.63%	22%
EU-27	**8,237.6**	**100.00%**	**100.00%**	**100%**

Source: FP7 participation data (E-CORDA, 1st November 2009) and Eurostat (FTE researcher data)

Overall, then, the trends in UK project involvement, participations and funding from FP5 to FP6 to FP7 are remarkably similar on all measures. On all three measures UK performance declined from FP5 to FP6 but has increased in FP7 offsetting most of the earlier decline. In comparison with other member states, the UK's performance has also improved on each of the four 'benchmarks' described above (GDP, GERD, FTE researchers and population) and the UK stands above its main comparator countries (France and Germany) on each of the measures.

In summary we can say that the UK is maintaining its dominant position within the FPs.

C.5. FP7 participation by type of organisation

C.5.1. Participations by organisation type

The standard classification of participants in FP7 by organisation (or 'activity') type contains five main categories. Figure 87 compares the breakdown of UK participations by organisation type with the breakdown for all FP7 participations. Unlike in FP6, each participation has an identified organisation type.

The data indicates that the UK's participation profile differs in important respects from that of FP7 as a whole. HEIs from the UK account for significantly more of the UK total (61%) than the FP6 average

(39%), while UK research institutes account for significantly less than the FP7 average (11% versus 26%). This is not a surprise given the structure of public sector research in the UK as compared to many other EU countries, with the UK's public sector research expenditure concentrated more in HEIs than in research institutes.

UK industry's (private commercial) and Public bodies' shares of participations were roughly in line with their respective averages for FP7. Participations by 'other' organisations from the UK were at a level slightly below the FP7 average (2% for the UK as compared to 3% for FP7 overall). However, it should be noted that we are reporting relative shares here, so the UK HEI's very high comparative level of involvement means that the other four groups are likely to occupy a smaller share than is the case in other countries where the HEI sector is not as strong.

Figure 87 – Breakdown of UK FP7 participations and all FP7 participations, by type of organisation

Organisation Type	Number (and share) of participations - UK	Number (and share) of participations – FP7 overall
Higher or secondary education est.	2,238 (61%)	11,752 (39%)
Private commercial	826 (22%)	8,072 (26%)
Public body (excl. res. and educat.)	141 (4%)	1,983 (6%)
Research organisations	414 (11%)	7,883 (26%)
Others	60 (2%)	828 (3%)
Total	**3,679 (100%)**	**30,518 (100%)**

Source: FP7 participation data (E-CORDA, 1st November 2009)

C.5.2. FP7 funding by organisation type

Figure 88 shows the total FP7 funding allocations for UK organisations, by organisation type, and compares these to the breakdown of FP7 funding allocations as a whole.

UK HEIs were allocated a total of €889 million in funding. This represented 66% of all FP7 funding to UK organisations, a significantly larger share than that obtained by HEIs across FP7 as a whole (42%). UK HEIs received an average of €397k in funding per participation, 21% above the FP7 average of €327k per HEI participation. This means that UK HEIs have not only had a very large number of participations in FP7, they have also had a relatively high level of funding per participation. These factors combine to make UK HEIs far more dominant within the national participant mix than is the case for other countries.

UK private commercial organisations (industry) received €269 million in funding. This represented 20% of UK's total, slightly lower than the share of funding obtained by private commercial organisations across FP7 as a whole (24%) and also below the share that might be expected given the level of UK industry participation (22% of the UK total). The average amount of funding provided to UK industry per participation was €326k, 20% above the overall FP7 average (€271k per industrial participation). This is mostly caused by the UK's lower relative share of participations by the private commercial organisations compared to their share of FP7 overall.

UK public bodies were allocated €40 million in funding. This represented 3% of the UK's total, which is exactly the same as the overall share obtained by public bodies in FP7 as a whole (where the total number of participations was 311). The average amount of funding per UK public body participation was €245k, significantly above the €157k overall FP7 average.

UK research organisations were allocated €138 million in funding. This represented 10% of the UK's total, well below the overall share obtained by research organisations across FP7 as a whole (29%). The average amount of funding per UK research organisation participation was €334k, slightly below the overall FP7 average of €341k per research organisation participation. Comparing these numbers we have to bear in mind that the number of UK Research organisation participations is relatively low, due to the dominance of HEIs within the UK's public sector research base.

Other UK participants were allocated €12 million in funding. This represented only 1% of the UK's total funding from FP7, lower than the share received by 'other' organisations across FP7 as a whole (2%). The average amount of funding per participation was €200k, 9% below the FP7 average of €220k per participation realised by 'other' organisations across FP7 as a whole.

Figure 88 – UK FP7 funding, by type of organisation

Organisation Type	UK funding allocations (€m)	Total FP6 funding allocations (€m)
Higher or secondary education est.	889 (66%)	3,843 (42%)
Private commercial	269 (20%)	2,186 (24%)
Public body (excl. res. and educat.)	40 (3%)	311 (3%)
Research organisations	138 (10%)	2,694 (29%)
Others	12 (1%)	182 (2%)
Total	**1,348 (100%)**	**9,216 (100%)**

Source: FP7 participation data (E-CORDA, 1st November 2009)

C.6. Numbers of UK organisations participating in FP7

As already indicated there are no participations with unidentified organisation types, however it is not easy to accurately calculate the number of discrete organisations participating in FP7 due to problems with the same organisation appearing under slightly different names within the participation database. It is not possible to revise the name of each respondent in the whole database of 10,258 participants. Therefore for the comparison of the UK and overall FP7 data we have used the 'uncleaned' data.

Figure 89 reveals that in the UK, industry (private commercial organisations) makes up the majority (67%) of the UK participants in FP7, although industry's share of participations and funding is less than 23% of the UK's total. In FP7 overall 53% of all participants were from private commercial organisations.

Conversely, HEIs make up only 12% of the participating organisations from the UK, but account for over half of the funding. This reflects the relative scale of the organisations involved - HEIs are large organisations with many researchers and research groups, while most industry participants are small organisations typically involved in only one or two projects. Out of all FP7 participants, 15% were HEIs. The lower relative percentage of UK HEIs might however only reflect it's higher number of participating industry organisations

UK Research organisations accounted for 9% of all UK participants, a considerably lower share than in FP7 overall (17%). A similar pattern, though less pronounced, is visible in the case of public bodies (7% of the UK organisations and 10% in the case of all FP7 participants).

The participant share of UK organisations from the 'other' organisations was roughly in line with their equivalent in FP7 overall.

Figure 89 – UK FP7 participants, by type of organisation

Organisation Type	UK organisations	All organisations
Higher or secondary education est.	108 (12%)	1,502 (15%)
Private commercial	607 (67%)	5,457 (53%)
Public body (excluding research and education)	60 (7%)	1,015 (10%)
Research organisations	83 (9%)	1,707 (17%)
Others	43 (5%)	581 (6%)
Total[45]	**901 (100%)**	**10,262 (100%)**

Source: FP7 participation data (E-CORDA, 1st November 2009)

Because FP7 is still in train, absolute numbers in Figure 87, Figure 88 and Figure 89 will change significantly over the course of the programme, but the relative proportions achieved by each group

[45] Figures include 4 respondents who had assigned themselves with multiple activity types in all FP7, out of which one was from the UK

are likely to remain the same, with HEIs dominating in terms of numbers of participations and amounts of funding, despite being fewer in number than industry participants.

C.6.1. FP7 top 10 participating organisations by type of organisation

In order to find the most frequently participating organisations and to see the overlap between FP6 and FP7 participants, we use the cleaned participant names. For this purpose we also had to select one organisation type in those cases where multiple organisation types were linked to one participant. This choice was made based on number of selections. For example University of Leeds had one participation where its organisation type was selected as 'other' and 47 participations where its organisation type was listed as HEI. Its organisation type was therefore corrected to HEI.

Figure 90 lists the top 10 performing organisations in each category based on the number of participations in FP7. University of London, which is a federation of 19 self-governing Colleges ranked first with 293 participations. Cambridge University and Oxford University had both more than 135 participations and none of the top 10 UK universities has less than 55 participations. Private commercial participants' participations range from 18 (Rolls Royce) to 6 (Thales). Within Public bodies, DEFRA leads with 29 participations, followed by Natural history museum and MET Office. The rest of Public bodies have so far less than 14 participations. The top 3 Research organisations had more than 33 participations each with Medical Research Council leading the table with 57. In organisation type Other, Institute of nanotechnology leads the table with 7 participations, followed by MIRA with 4 participations.

Figure 90 – Top 10 participating organisations in FP7 based on number of participations

Higher/ secondary ed.	Private commercial	Public body (excl. res & ed)	Research organisations	Others
University Of London[46]	Rolls Royce PLC	DEFRA	Medical Research Council	Institute Of Nanotechnology
Cambridge University	NEC Europe LTD	Natural History Museum	Natural Environment Research Council	Mira
Oxford University	BT	Met Office	Science And Technology Facilities Council	New And Renewable Energy Centre
Imperial College London	QINETIQ LIMITED	BBC	Cancer Research UK	AIM UK
University Of Manchester	Airbus UK	HSE	Health Protection Agency	British Association For The Advancement Of Science
University Of Edinburgh	BMT LIMITED	British Council	TWI LIMITED	Genetic Interest Group
University Of Southampton	BAE Systems LIMITED	Scottish Enterprise	John Innes Centre	Targeting Innovation LIMITED
University Of Sheffield	Beta Technology LTD	Advantage West Midlands	Genome Research LIMITED	Wellcome Trust
University Of Nottingham	Johnson Matthey PLC	Association Of Commonwealth Universities	UK Intelligent Systems Research Institute LIMITED	WWF-UK
University Of Newcastle Upon Tyne	Thales	Belfast Health And Social Care Trust	Scottish Association For Marine Science	Alliance Of Religions And Conservation

Source: FP7 participation data (E-CORDA, 1st November 2009)

C.6.2. Overlap between participants in FP6 and FP7

With 1,845 UK organisations participating in FP6 and, so far, 868 in FP7 we would expect a certain degree of overlap, with many of the FP6 participants also active in FP7 and vice versa. In fact 377 participants from FP6 have already participated in FP7, equivalent to 20% of all FP6 participants. Of the 868 UK participants in FP7 377 or 43% participated in FP6.

[46] Federation of 19 self-governing Colleges

C.7. FP7 participation by Thematic Priority Area

An analysis of FP7 participation by Priority Areas provides an indication of the main research fields in which UK organisations are active.

FP7 is made up of five specific programmes, as follows:

1. Cooperation
2. Ideas
3. People
4. Capacities
5. Nuclear Research

The **first specific programme** focuses on fostering collaborative research and represents the core of FP7. It is split into 10 key thematic research areas:

- Health
- Food, agriculture and fisheries, and biotechnology
- Information and communication technologies
- Nanosciences, nanotechnologies, materials and new production technologies
- Energy
- Environment (including climate change)
- Transport (including aeronautics)
- Socio-economic sciences and the humanities
- Space
- Security
- (plus General activities – Annex IV)

The **second specific programme** supports "frontier research" and is implemented by the new European Research Council.

The **third specific programme** provides support for researcher mobility and career development. It is implemented via a set of Marie Curie actions.

The **fourth specific programme** strengthens research capacities in Europe and covers seven activities:

- Research infrastructures
- Research for the benefit of SMEs
- Regions of knowledge
- Research potential of convergence regions
- Science in society
- Coherent development of research policies
- Activities of international cooperation

The **fifth specific programme** is for nuclear research and training activities and is split into two specific programmes:

- Fusion energy research
- Nuclear fission and radiation protection

This gives a total of 22 Priority Areas under which FP7 has been organised and against which the participation data is reported.

C.7.1. Projects, participations and EC funding, by Priority Area

Figure 91 shows the number of UK projects and participations, and the volume of EC funding allocated, in each of the FP7 Priority Areas. Due to the differing scales of the different areas, it is not possible to draw conclusions on the performance of the UK from this table, but in terms of numbers alone, the **Health** and **ICT** areas are the most significant, with over 230 projects, over 470 participations and in excess of €208 million in funding achieved by UK in each. **Marie Curie**

Actions have an even higher number of projects and participations, however the amount of EC funding is substantially less than for the two aforementioned priority areas.

Figure 91 – UK projects, participations and EC funding in FP7, by Priority Area

Priority	Projects	Participations	EC funding (€ million)
Energy	54	107	28.5
Environment (including Climate Change)	97	213	52.1
Food, Agriculture, and Biotechnology	86	157	51.6
General Activities (Annex IV)	3	3	0.7
Health	238	474	208.1
Information & Communication Technologies	348	582	239.5
Nanosciences, Nanotechnologies, Materials and new Production Technologies	120	249	76.3
Security	27	51	18.5
Socio-economic sciences and Humanities	80	119	25.6
Space	12	37	15.4
Transport (including Aeronautics)	117	250	82.3
Activities of International Cooperation	6	6	1.0
Coherent development of research policies	3	4	0.5
Regions of Knowledge	5	5	0.4
Research for the benefit of SMEs	103	213	25.6
Research Infrastructures	107	252	147.8
Research Potential	3	3	0.1
Science in Society	49	74	8.4
Marie-Curie Actions	586	687	155.3
European Research Council	134	140	198.9
Fusion Energy	3	8	1.1
Nuclear Fission and Radiation Protection	23	45	10.7
Total	**2,204**	**3,679**	**1,348.3**

Source: FP7 participation data (E-CORDA, 1st November 2009)

In order to place the raw numbers in context, Figure 92 presents UK projects, participations and EC funding, expressed as a share of the FP7 totals for each Priority Area. Arrows (↑↔↓) have been used to symbolise whether the UK has performed comparatively strongly or less well in each area, as compared to UK's overall performance in FP7. For example, across FP7 as a whole, the UK has participated in 43% of projects, so we can say that a project participation rate of 59% in the Research for the benefit of SMEs area is 'above' average (↑), while involvement in 15% of the Regions of knowledge projects is below average (↓).

The results indicate that in terms of its level of project involvement the UK has performed strongly in most of the FP7 Priority Areas, achieving in many cases an involvement rate of between 50% and 80%. Because some of the areas involve smaller projects with lower levels of collaboration and fewer partners, it is not possible to achieve the same level of project involvement. These include the **Marie Curie Actions**, where a 29% involvement across all projects is a very high level of performance, and the **European Research Council** actions, where involvement in 20% of the projects is also very high and indicative of excellent performance by the UK.

For structural reasons the participation and funding share achieved by the UK is a better measure of relative performance, and here we can say that the areas of strongest performance in FP7 to date have been **Health**, **Socio-economic sciences and humanities**, **Marie Curie Actions** and **European Research Council**. Areas of relatively weaker performance include **Activities of International Cooperation**, **Coherent development of research policies**, **Regions of knowledge**, **General activities** (Annex IV) and **Research potential**. In the subject-based areas the UK's share of participations and funding appear to be lowest in the **Energy**, **Space**, and **Nanosciences** fields, although with around a 10% share in each case performance cannot really be considered to be weak.

Figure 92 – UK projects, participations and EC funding, expressed as a share of FP7 totals, by Priority Area

Priority	Project share	Participation share	EC funding Share
Energy	51%↑	10%↓	9%↓
Environment (including Climate Change)	70%↑	12%↔	13%↓
Food, Agriculture, and Biotechnology	70%↑	10%↓	13%↓
General Activities (Annex IV)	21%↓	4%↓	1%↓
Health	73%↑	14%↑	17%↑
Information & Communication Technologies	59%↑	10%↓	12%↓
Nanosciences, Nanotechnologies, Materials and new Production Technologies	63%↑	10%↓	10%↓
Security	59%↑	9%↓	11%↓
Socio-economic sciences and Humanities	80%↑	14%↑	19%↑
Space	57%↑	9%↓	8%↓
Transport (including Aeronautics)	64%↑	10%↓	12%↓
Activities of International Cooperation	19%↓	2%↓	3%↓
Coherent development of research policies	27%↓	7%↓	4%↓
Regions of Knowledge	15%↓	2%↓	2%↓
Research for the benefit of SMEs	59%↑	13%↔	12%↓
Research Infrastructures	78%↑	12%↔	22%↑
Research Potential	4%↓	2%↓	0%↓
Science in Society	69%↑	14%↑	16%↔
Marie-Curie Actions	29%↓	18%↑	22%↑
European Research Council	21%↓	20%↑	20%↑
Fusion Energy	100%↑	13%↔	22%↑
Nuclear Fission and Radiation Protection	72%↑	10%↓	12%↓
Total	**43%**	**12.1%**	**14.6%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

Figure 93 compares the profile of UK participation-level funding in each of the 22 Priority Areas and shows ratios of UK funding per participation compared to others in the same/all projects. It indicates that in 16 of the Priority Areas UK participants are receiving a higher funding amount on average than their partners in the same projects and than participants in all projects. Overall, UK participants received 23% more funding on average than their partners in the same projects, and 21% more than the average for all participants in all projects.

UK participants in the **Food, agriculture and biotech**, **General activities**, **Social-economic sciences and humanities**, **Research infrastructures** and **Fusion** areas received relatively high funding per participation compared to others in same projects. In the **Activities for international cooperation**, **Food, agriculture and biotech**, **Social-economic sciences and humanities** and **Research infrastructures** areas the volume of funding per UK participation is very high compared to others in all projects. These areas are therefore those where the level of UK involvement and / or the scale of the projects in which the UK is involved is much higher than average for those areas, suggesting that the UK partners are taking a major role and / or are participating in the more major projects.

Figure 93 – Comparison of average funding per participation in UK projects and in all projects, by Priority Area

Priority	Avg funding amount per UK participation (UK projects)	Avg funding amount per participation (UK projects)	Avg funding amount per participation (all projects)	UK funding per participation compared to others in the same projects	UK funding per participation compared to others in all projects
Energy	€ 266,329	€ 291,815	€ 289,080	91%	92%
Environment	€ 244,568	€ 220,978	€ 212,893	111%	115%
Food, Agr. and Biotech.	€ 328,732	€ 230,267	€ 238,264	143% (H)	138% (H)
General Activities	€ 220,143	€ 139,097	€ 1,329,197	158% (H)	17%
Health	€ 439,007	€ 379,156	€ 372,646	116%	118%
ICT	€ 413,596	€ 364,222	€ 360,529	114%	115%
Nanotech.	€ 306,382	€ 309,328	€ 305,712	99%	100%
Security	€ 341,678	€ 318,275	€ 281,509	107%	121%
Soc-economic, Humanities	€ 214,786	€ 158,667	€ 158,937	135% (H)	135% (H)
Space	€ 415,518	€ 352,850	€ 440,030	118%	94%
Transport	€ 329,396	€ 286,804	€ 278,675	115%	118%
Activities of Int. Coop	€ 171,636	€ 148,049	€ 126,494	116%	136% (H)
Development of res. Pol.	€ 117,245	€ 118,268	€ 195,322	99%	60%
Regions of Knowledge	€ 85,769	€ 81,776	€ 66,854	105%	128%
Research for SMEs	€ 120,405	€ 123,600	€ 124,559	97%	97%
Research Infrastructures	€ 586,571	€ 327,077	€ 321,598	179% (H)	182% (H)
Research Potential	€ 47,546	€ 123,004	€ 451,039	39%	11%
Science in Society	€ 113,790	€ 100,863	€ 98,249	113%	116%
Marie-Curie Actions	€ 226,022	€ 254,261	€ 181,676	89%	124%
ERC	€ 1,420,765	€ 1,293,896	€ 1,362,321	110%	104%
Fusion Energy	€ 134,484	€ 78,109	€ 78,109	172% (H)	172% (H)
Nuclear Fission	€ 236,982	€ 203,910	€ 206,111	116%	115%
Total	**€ 366,492**	**€ 297,743**	**€ 301,999**	**123%**	**121%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

C.8. FP7 participation by Type of Instrument

FP7 employed a range of different types of instruments (projects and actions) to implement its priorities, with a different profile of instruments being used within each of the areas discussed above.

The instruments employed by FP6 were as follows:[47]

- **Research for the benefit of specific groups (in particular SMEs)** – Support for research projects where the bulk of the research and technological development is carried out by universities, research centres or other legal entities, for the benefit of specific groups, in particular SMEs or associations of SMEs. Efforts will be made to mobilise additional financing from the European Investment Bank (EIB) and other financial organisations
- **Collaborative projects** – Support for research projects carried out by consortia with participants from different countries, aiming at developing new knowledge, new technology, products, demonstration activities or common resources for research. The size, scope and internal organisation of projects can vary from field to field and from topic to topic. Projects can range from small or medium-scale focused research actions to large scale integrating projects for achieving a defined objective. Projects should also target special groups such as SMEs and other smaller actors.
- **Coordination and support actions** – Support for activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc.). These actions may also be implemented by means other than calls for proposals.
- **Combination of CP & CSA** – Support for the preparatory phase leading to the construction of new research infrastructures or major upgrades of existing ones. This activity should help the majority of projects for new research infrastructures to reach the level of technical, legal and financial maturity required to enable the construction work to start.
- **Support for "frontier" research** – Support for projects carried out by individual national or transnational research teams. This scheme will be used to support investigator-driven "frontier" research projects funded in the framework of the European Research Council. This instrument includes ERC Starting Grant and Call Advanced Grant.
- **Support for training and career development of researchers** – Support for training and career development of researchers, mainly to be used for the implementation of Marie Curie actions. This includes Initial training networks, Industry-academia partnerships and pathways, Life-long training, International dimension, and Specific actions.
- **Networks of Excellence** – Support for a Joint Programme of Activities implemented by a number of research organisations integrating their activities in a given field, carried out by research teams in the framework of longer term cooperation. The implementation of this Joint Programme of Activities will require a formal commitment of the organisations integrating part of their resources and their activities.
- **Article 169 of the Treaty** – A financial contribution from the Community to the joint implementation of well identified national research programmes, on the basis of Article 169 of the Treaty. Such a joint implementation requires the establishment or existence of a dedicated implementation structure. Community financial support will be provided subject to the definition of a financing plan based on formal commitments of the competent national authorities.
- **Article 171 of the Treaty** – A financial contribution from the Community to the implementation of Joint Technology Initiatives to realise objectives that cannot be achieved through the funding schemes identified above. Joint Technology Initiatives will mobilise a combination of funding of different kinds and from different sources: private and public, European and national. This funding may take different forms and may be allocated or mobilised though a range of mechanisms: support from the Framework Programme, loans from the European Investment Bank (EIB), or risk capital support. Joint Technology Initiatives may be decided and implemented on the basis of Article 171 of the Treaty (this may include the creation of joint undertakings) or by the Decisions establishing the specific programmes. Community

[47] Source: Cordis (2010) GUIDE FOR APPLICANTS: Capacities – Research Infrastructures, [online] available at http://rp7.ffg.at/Kontext/WebService/SecureFileAccess.aspx?fileguid=%7B3d5aa05a-59d2-4560-ab1c-e258a66e4ca9%7D,

support will be provided subject to the definition of an overall blueprint of financial engineering, based on formal commitments of all parties concerned.

C.8.1. Project, participations and EC funding, by Type of Instrument

Figure 94 shows the numbers of projects and participations, and the volume of EC funding, achieved by UK participations for each of the main types of instrument covered by the FP7 database. As with the priority areas above, the various instruments have been used to a greater or lesser degree across FP7 and so it is not possible to draw firm conclusions on the performance of the UK from this table. However, in terms of numbers alone, UK participation was highest for Collaborative projects, followed by Support for Training and Career Development of Researchers. For each of these types of instrument, the UK has achieved at least 585 projects, 685 participations and €155 million in funding.

Figure 94 – UK projects, participations and EC funding, by Type of Instrument

Instrument	Projects	Participations	EC funding (€ million)
Research for the Benefit of Specific Groups	101	216	26.5
Collaborative Project	1,012	1,975	757.1
Coordination and Support Action	273	415	54.8
Combination of CP & CSA	81	202	140.5
Support for Frontier Research (ERC)	133	139	198.7
Support for Training and Career Development of Researchers	585	685	155.2
Network of Excellence	19	47	15.4
Article 169 of the Treaty	-	-	-
Article 171 of the Treaty	-	-	-
Pilot Type B	-	-	-
Risk-Sharing Finance Facility	-	-	-
Total	**2,204**	**3,679**	**1,348.3**

Source: FP7 participation data (E-CORDA, 1st November 2009)

In order to place the raw numbers shown in the above figure into context, UK projects, participations and EC funding have been expressed as a share of the FP7 totals for each type of instrument. The results are shown in Figure 95, and arrows (↑↔↓) have been used to symbolise whether the UK has performed comparatively strongly or less well for each type of instrument, as compared to the UK's overall performance in FP7. For example, across FP7 as a whole, the UK participated in 43% of projects, so we can say that a project participation rate of 90% within *Networks of excellence* is 'above average' (↑), while involvement in 20% of *Coordination and Support Action* is 'below average' (↓).

None of the UK results show comparatively strong performance in terms of all three indicators. The results are rather mixed. The UK has however performed well in terms of share of projects as well as share of funding in Combination of CP & CSA. It has performed strongly based on participation and funding in Support for Training and Career Development of Researchers and Support for Frontier Research. The UK's performance in terms of share of projects has been impressive in *Networks of excellence*, however the shares of participation and funding were near to the UK average.

The UK has performed comparatively less well in terms of its share of projects, participations and funding in Coordination and Support Action. It has also performed below average in terms of funding in Research for the Benefit of Specific Groups, Collaborative Projects, Coordination and Support Action. In terms of project participation, the UK's share was lower than its average in Coordination

and Support Action, Support for Frontier Research (ERC) and Support for Training and Career Development of Researchers. Average performance has been evident except for aforementioned in Networks of excellence also in participation shares of Collaborative Project and Combination of CP & CSA.

Figure 95 – UK projects, participations and EC funding, expressed as a share of FP7 totals, by Type of Instrument

Instrument	Project share	Participation share	EC funding share
Research for the Benefit of Specific Groups	58%↑	14%↑	13%↓
Collaborative Project	67%↑	12%↔	13%↓
Coordination and Support Action	36%↓	7%↓	7%↓
Combination of CP & CSA	82%↑	12%↔	23%↑
Support for Frontier Research (ERC)	20%↓	20%↑	20%↑
Support for Training and Career Development of Researchers	31%↓	21%↑	23%↑
Network of Excellence	90%↑	12%↔	16%↔
Article 169 of the Treaty	-	-	-
Article 171 of the Treaty	-	-	-
Pilot Type B	-	-	-
Risk-Sharing Finance Facility	-	-	-
Total	**43%**	**12%**	**15%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

C.9. Nature of FP7 participation

Participants in the Framework Programmes can occupy the role of project coordinator or are otherwise listed simply as one of the participants. Analysis of the UK's FP7 participations reveals that the UK partner has occupied the role of project coordinator in 917 cases, or 42% of the projects in which UK participants have been involved. This means that the UK participants were in a coordinating role for 25% of all UK FP7 participations, well above the FP7 average of 17%.

Patterns of UK coordination by FP7 Priority Area have been analysed, and are shown in Figure 96. It reveals higher than average coordination rates for the UK in many of the Priority Areas, particularly in the **Food, agriculture and biotechnology**, **General activities**, **Socio-economic sciences and humanities**, and **Fusion energy** Areas, where UK coordinator to participation ratios were approximately double the overall FP7 rate. Areas of relatively low UK coordinator ratios in comparison with overall FP7 figures were **Energy**, **Information and communication technologies**, and **Space**. In addition, there have been no UK coordinators in three of the Priority areas (Coherent development of research policies, Regions of knowledge, and Research potential Areas).

Figure 96 – UK coordination levels by FP7 Priority Area

Priority	UK coordinators	Coordinator to participant ratio (UK)	Coordinator to participant ratio (FP7 overall)
Energy	8	7%↓	9%
Environment (including Climate Change)	18	8%↔	7%
Food, Agriculture, and Biotechnology	20	13%↑	7%
General Activities (Annex IV)	1	33%↑	18%
Health	54	11%↔	10%
Information & Communication Technologies	48	8%↓	10%
Nanosciences, Nanotechnologies, Materials and new Production Technologies	23	9%↔	8%
Security	7	14%↑	9%
Socio-economic sciences and Humanities	27	23%↑	12%
Space	1	3%↓	5%
Transport (including Aeronautics)	20	8%↔	7%
Activities of International Cooperation	1	17%↑	10%
Coherent development of research policies	0	0%↓	18%
Regions of Knowledge	0	0%↓	11%
Research for the benefit of SMEs	28	13%↔	10%
Research Infrastructures	18	7%↔	7%
Research Potential	0	0%↓	58%
Science in Society	10	14%↔	13%
Marie-Curie Actions	498	72%↑	53%
European Research Council	129	92%↔	91%
Fusion Energy	1	13%↑	5%
Nuclear Fission and Radiation Protection	5	11%↑	7%
Total	**917**	**25%↑**	**17%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

We have also looked at coordination ratios in types of instrument, where the likelihood of being a project coordinator varies significantly depending on the type of instrument in which organisations are involved. For example, the Networks of Excellence have an average of 30 partners and it is therefore relatively difficult to occupy a high share of coordinator roles within this type of instrument. However, Support for training and career development of researchers have an average of only two partners, so we would expect to identify a high share of coordinator roles for this instrument.

Figure 97 presents the number of UK coordinators for each type of instrument and the ratio of UK coordinators to participants. The average FP7 coordinator to participant ratio for each type of instrument is also shown for comparison. Arrows (↑↔↓) have again been used to symbolise whether UK's coordination levels for each type of instrument are above, below, or in line with the overall picture. The data indicates that UK partners have occupied the role of coordinator to a higher degree than the overall FP7 average for most instruments, particularly Networks of excellence where the UK coordinator ratio is nearly double the overall FP7 rate.

Figure 97 – UK coordination levels by type of Instrument

Instrument	UK coordinators	Coordinator to participant ratio (UK)	Coordinator to participant ratio (FP7 overall)
Research for the Benefit of Specific Groups	30	14%↑	11%
Collaborative Project	195	10↔	9%
Coordination and Support Action	49	12%↔	13%
Combination of CP & CSA	14	7%↓	6%
Support for Frontier Research (ERC)	128	92%↓	93%
Support for Training and Career Development of Researchers	497	73%↑	58%
Network of Excellence	4	9%↑	5%
Article 169 of the Treaty	-	-	-
Article 171 of the Treaty	-	-	-
Pilot Type B	-	-	-
Risk-Sharing Finance Facility	-	-	-
Total	**917**	**25%**	**17%**

Source: FP6 participation data (E-CORDA, 1st November 2009)

Analysis of the organisation (activity) type of the UK coordinators revealed that HEIs and research institutes were most likely to fulfil the role of coordinator, occupying the position of coordinator in 44% and 34% of participations respectively. Industry participants were coordinators in 7% of their participations, public bodies were coordinators in 18%, and for 'other' organisations the figure was 12%. The UK's coordinator ratio is higher than the overall FP7 profile in case of HEIs, Public bodies and Research organisations. This suggests that these organisations occupy more important roles in projects.

C.10. Collaboration within FP7 projects

C.10.1. Overall extent of collaboration

Through the 3,679 participations in 2,204 FP7 projects, UK actors have collaborated with a large number of other organisations from a range of countries. Overall statistics on the extent of this collaboration are as follows:

- The number of *participations* in FP7 projects with UK involvement, *excluding the UK participations*, is 16,207
- The number of non-UK *participants* in the projects in which the UK was involved is calculated as 6,417[48]. However, due to the problem of the same organisation being listed under several different names (or more accurately different spellings of the same name) we believe that this over-estimates the true figure
- The average number of partners in an FP7 project in which the UK was involved was 9.0, which is higher than the average for all FP7 projects (6.0). Further analysis of the scale of collaboration within UK projects is presented in the following section
- Through its FP7 projects, UK actors have collaborated with partners from 120 different countries. More detailed information on the patterns of collaboration with the Member States and with other countries is provided below

[48] Number of participations is calculated based on original uncleaned data

C.10.2. Collaboration between UK organisations within FP7 projects

With 3,679 participations across 2,204 projects it is clear that in some cases more than one UK partner is involved in the same FP7 project. In fact, there are 824 FP7 projects with more than one UK partner involved (37% of the projects in which UK has been involved). The profile of intra-UK collaboration within the 2,204 projects is shown in Figure 98 below. It reveals that the largest number of UK participants in a single FP7 project is 11.

Figure 98 – Number and share of UK FP7 projects with >1 UK partners

UK partners	Number of FP7 projects	Share of FP7 projects
1 (no intra-UK collaboration)	1,380	63%
2	475	22%
3	185	8%
4	92	4%
5	35	2%
6	21	1%
7	9	0.4%
8	4	0.2%
9	1	0.05%
10	1	0.05%
11	1	0.05%
Total	**2,204**	**100%**

Source: FP7 participation data (E-CORDA, 1st November 2009)

We have also looked at the extent of intra-UK collaboration within each of the Priority areas. There have been intra-UK collaborations in all priority areas except General Activities, Activities of International Cooperation, Regions of Knowledge and Research Potential. The priority areas where the level of this collaboration was highest (proportionately) were ERC and Space (67% each). 11 of the priority areas actually have more than 50% of projects with more than 1 UK partner.

C.10.3. Collaboration with actors from different countries

There are 16,207 participations by organisations from other countries in UK FP7 projects, with the partners being drawn from 120 different countries.

Figure 99 presents data on the number and share of participations by actors from other countries within UK projects, listing first the 26 other EU Member States, then the current Candidate countries. In volume terms the greatest number and share of collaborations have taken place with partners in Germany, France and Italy (with 16%, 11% and 10% of the collaborations each respectively). However, this reflects mainly the high levels of participation in FP7 by these countries as a whole.

A better indicator of the strength of collaboration between the UK and other countries is shown in the final column, which expresses the ratio of each country's share of all participations in UK projects to their overall share of FP7 participations. Using this indicator, the most active Member State collaboration partners are Lithuania, the Netherlands and Germany, each with at least a 5% higher level of participation in UK projects than in all FP7 projects. The least active Member State by this indicator is Latvia.

Figure 99 – UK collaboration with actors from different countries – EU Member States and Candidate countries

Country		Participations in UK projects	Share of all participations in UK projects	Ratio of participation in UK projects to overall level of FP7 participation
EU Member States	Austria	445	2.746%	93%
	Belgium	721	4.449%	99%
	Bulgaria	135	0.833%	90%
	Cyprus	52	0.321%	83%
	Czech Republic	261	1.610%	105%
	Denmark	381	2.351%	105%
	Estonia	86	0.531%	94%
	Finland	399	2.462%	104%
	France	1858	11.464%	103%
	Germany	2598	16.030%	106%
	Greece	516	3.184%	92%
	Hungary	244	1.506%	95%
	Ireland	230	1.419%	104%
	Italy	1632	10.070%	99%
	Latvia	47	0.290%	78%
	Lithuania	73	0.450%	111%
	Luxembourg	22	0.136%	76%
	Malta	37	0.228%	96%
	Netherlands	1108	6.837%	108%
	Poland	367	2.264%	105%
	Portugal	273	1.684%	95%
	Romania	163	1.006%	83%
	Slovakia	92	0.568%	102%
	Slovenia	139	0.858%	91%
	Spain	1216	7.503%	99%
	Sweden	693	4.276%	104%
Candidate countries	Turkey	104	0.642%	76%
	Croatia	42	0.259%	72%
	FYR of Macedonia	15	0.093%	67%

Source: FP7 participation data (E-CORDA, 1st November 2009)

Figure 100 shows the numbers and share of collaborations with all *other* countries where the number of participations within UK projects was 25 or more. Switzerland and Norway lead in terms of the number of participations in UK projects, with 589 and 324 participations respectively. Proportionately the most significant collaboration partners are Australia, 'European Union' and China. All three collaborated with the UK at a level at least 20% higher than might be expected given their overall levels of participations in FP7.

Figure 100 – UK collaboration with actors from different countries – Other countries with >25 participations in UK projects

	Country	Participations in UK projects	Share of all participations in UK projects	Ratio of participation in UK projects to overall level of FP7 participation
Countries with 10+ participations in UK projects	Argentina	27	0.2%	93%
	Australia	53	0.3%	120%
	Brazil	48	0.3%	117%
	Canada	48	0.3%	105%
	China	78	0.5%	120%
	European Union (JRC)	73	0.5%	120%
	Iceland	41	0.3%	113%
	India	77	0.5%	111%
	Israel	190	1.2%	73%
	Norway	324	2.0%	115%
	Russia	116	0.7%	98%
	Serbia	28	0.2%	57%
	South Africa	45	0.3%	115%
	Switzerland	589	3.6%	97%
	Ukraine	47	0.3%	102%
	United States	111	0.7%	77%

Source: FP7 participation data (E-CORDA, 1st November 2009)

C.10.4. Collaboration between different types of organisation

The partners in the UK FP7 projects breakdown by organisation type are shown in the penultimate column of Figure 101. For comparison, the figure also shows the breakdown of all FP7 participations and all UK participations by organisation type. The spread of UK partners by organisation type is almost identical to the overall participation rates for FP7 overall, suggesting that while HEIs dominate the UK's involvement profile this has not led to a significantly different pattern of collaboration within the UK projects.

Figure 101 – Partners in UK FP7 projects, by type of organisation

Organisation Type	Participations – UK	Participations in UK projects	Participations – FP6 overall
Higher or secondary education est.	2,238 (61%)	7,898 (40%)	11,752 (39%)
Private commercial	826 (22%)	5,259 (26%)	8,072 (26%)
Public body (excl. res. and educat.)	141 (4%)	1,146 (6%)	1,983 (6%)
Research organisations	414 (11%)	5,142 (26%)	7,883 (26%)
Others	60 (2%)	441 (2%)	828 (3%)
Total	**3,679 (100%)**	**19,886 (100%)**	**30,518 (100%)**

Source: FP6 participation data (E-CORDA, 1st November 2009)

C.11. UK demand for participation in FP7

C.11.1. Proposals submitted to FP7 with UK participation

Information on all proposals submitted to FP7 was taken from the E-CORDA database (1st November 2009 release), and a simple count revealed that there have been a total of 235,750 participations in 45,994 proposals to date. An analysis of UK participation in these proposals revealed that the UK has 25,618 participations in 16,184 proposals. At a very basic level we can say that the UK has participated in 35.2% of the submitted proposals and accounts for 10.9% of all participations in FP7 proposals to date.

Figure 102 shows the level of UK involvement in proposals submitted to FP7 to date, by priority area. It shows that the share of proposals with UK involvement has been highest in the Health, Socioeconomic science & Humanities and Research Infrastructures areas. UK involvement in FP7

proposals has been lowest in the Activities of International Cooperation, Regions of Knowledge, European Research Council and Research Potential areas. However, European Research Council proposals tend to involve only one partner and so an involvement rate of 14% is very respectable, suggesting that the UK has been responsible for 1 in 7 of all proposals submitted for ERC grants.

Figure 102 – UK's participation in FP7 proposals, by Priority Area

Priority	All proposals	UK proposals	Demand - share of bids with UK involvement
Energy	1,157	459	40%
Environment (incl. Climate Change)	1,386	797	58%
Food, Agriculture, & Biotech.	1,312	699	53%
General Activities (Annex IV)	45	14	31%
Health	2,501	1,531	61%
Information and Communication Technologies	5,521	3,110	56%
Nanosciences, Nanotechnologies, Materials & NPT	2,359	764	32%
Security	624	346	55%
Socioeconomic science. & Humanities	1,442	873	61%
Space	208	106	51%
Transport (including Aeronautics)	1,414	786	56%
Activities of International Cooperation	194	44	23%
Coherent development of research policies	23	7	30%
Regions of Knowledge	261	57	22%
Research for the benefit of SMEs	1,888	988	52%
Research Infrastructures	463	282	61%
Research Potential	1,277	36	3%
Science in Society	480	226	47%
Marie-Curie Actions	9,435	3,027	32%
European Research Council	13,860	1,952	14%
Fusion Energy	10	4	40%
Nuclear Fission and Radiation Protection	134	76	57%
Total	**45,994**	**16,184**	**35%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

Figure 103 shows the level of UK involvement in proposals for each type of instrument used to implement the FP7 priorities. It reveals that the level of UK involvement varies considerably, driven mainly by the nature of the instruments themselves. So, for example, the UK's involvement rate is highest for the larger, multi-partner actions such as Networks of Excellence, Collaborative Projects and Research for the Benefit of Specific Groups. Similarly, involvement rates have been lower in 'single partner' actions such as the Support for Frontier Research actions employed within the European Research Council priority area.

Figure 103 – Demand – share of bids with UK involvement in FP7 proposals, by Instrument

Priority	All proposals	UK proposals	Demand - share of bids with UK involvement
Research for the Benefit of Specific Groups	1,856	992	53%
Collaborative Project	16,150	8,643	54%
Coordination and Support Action	4,524	1,289	28%
Combination of CP & CSA	330	220	67%
Support for Frontier Research (ERC)	13,837	1,947	14%
Support for Training and Career Development of Researchers	9,209	3,025	33%
Network of Excellence	88	68	77%
Article 169 of the Treaty	-	-	-
Article 171 of the Treaty	-	-	-
Pilot Type B	-	-	-
Risk-Sharing Finance Facility	-	-	-
Total	**45,994**	**16,184**	**35%**

Source: FP7 proposal data (E-CORDA, 1st November 2009

Analysis of participation in proposals by each main type of FP7 participant (activity type) has already been carried out. The data reveal that 58% of participations in proposals by UK organisations came from the HEI sector, 21% from private commercial businesses, 9% from research organisations, 3% from public bodies and the remaining 6% from 'other' organisations.

Figure 104 shows the level of UK participation in FP7 proposals to date by each main type of participant. It reveals that the UK's share of all participations in proposals has been highest within the HEI sector, making up 15% of all participations in proposals, followed by private commercial (industry) making up 10% of all participations by that group.

Figure 104 – Demand – share of bids with UK involvement in FP7 proposals, by type of organisation

	All participations in proposals	UK participations in proposals	Demand – share of proposal participations
Higher or secondary education est.	89,853	13,628	15%
Private commercial	56,296	5,476	10%
Public body (excl. res. and educat.)	10,247	742	7%
Research organisations	44,460	2,210	5%
Others	17,266	1,458	8%
Total[49]	**235,750**	**25,618**	**11%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

C.12. UK success rates when applying to FP7

Because FP7 is still underway and because of the way in which the Commission presents its data, it is not possible to provide a definitive analysis of success rates within FP7 at this stage. While we can provide an accurate and up to date picture of the numbers of proposals submitted and the level of UK involvement in these, not all of those proposals have been assessed and not all of the successful proposals have yet proceeded to contract stage and been entered into the participation (contracts) database. As such, the calculated success rates while FP7 is still in train are significantly lower than

[49] Figures include participations where activity type is not identified (2,104 participations of UK proposals and in 17,628 participations of all FP7 proposals)

the actual true success rates that will ultimately be achieved. This is true for all of the data reported here (i.e. overall FP7 success rates and UK success rates). For this reason we have to issue a health warning in relation to the figures presented below, as they represent the situation at the time of writing the report and will be subject to ongoing change during the course of FP7. Indeed, it will not be possible to provide a definitive account of FP7 success rates until all proposals have been submitted and assessed and all contracts have been signed.

C.12.1. UK success rates in applying to FP7 – overall

The UK's overall proposal-level success rate for FP7 to date is 14%, significantly above the average success rate figures for FP7 as a whole (11%), although both percentages are expected to rise as the number of signed contracts increases. The fact that the UK's overall proposal-level success rate in FP7 (14%) is currently well below its success rate for FP6 (20%) should therefore not be any cause for alarm. All we can say at present is that in the early part of FP7 the UK has continued to achieve higher than average success rates within the competition.

C.12.2. UK success rates in applying to FP7 – by priority area

Figure 105 shows the success rates of proposals with UK participation and compares these to the overall success rates for all proposals submitted to FP7, by Priority Area. It shows that UK proposal success rates were above the FP7 average in 17 of the 22 Priority Areas, with UK performing particularly well in the following areas, where UK success rates were more than 30% higher than the FP7 averages: Fusion Energy, Nanotech, Science in Society, European research Council, Socioeconomic sciences & Humanities and Food, Agriculture and Biotech. UK proposal success rates were below average in relation to the FP average in Regions of Knowledge, General Activities (Annex IV), Activities of International Cooperation, Marie-Curie Actions and Coherent development of research policies. There were no priority areas where the UK had no successful proposals.

Figure 106 shows corresponding data for participations in proposals rather than proposals themselves. In terms of participations in proposals the UK has considerably higher success rates (over 30% of the FP7 averages) in following four areas: Environment, Science in Society, European research Council, and Socioeconomic sciences & Humanities.

UK proposal success rates were below average in relation to the FP average in General Activities (Annex IV), Security, Space, Transport, Activities of International Cooperation, Regions of Knowledge. There were no priority areas where the UK had no successful proposals.

Figure 105 – UK and all FP7 proposal success rates by Priority Area

Priority	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP7	Ratio of UK success rates to FP7 success rates
Energy	459	54	12%	9%	130%
Environment (including Climate Change)	797	97	12%	10%	122%
Food, Agriculture, and Biotechnology	699	86	12%	9%	132%
General Activities (Annex IV)	14	3	21%	31%	69%
Health	1,531	238	16%	13%	120%
Information and Communication Technologies	3,110	345	11%	11%	104%
Nanosciences, Nanotechnologies, Materials and new Production Technologies	764	120	16%	8%	194%
Security	346	30	9%	8%	108%
Socio-economic sciences and Humanities	873	80	9%	7%	132%
Space	106	12	11%	10%	112%
Transport (including Aeronautics)	786	117	15%	13%	115%
Activities of International Cooperation	44	6	14%	16%	85%
Coherent development of research policies	7	3	43%	48%	90%
Regions of Knowledge	57	5	9%	13%	69%
Research for the benefit of SMEs	988	103	10%	9%	112%
Research Infrastructures	282	107	38%	30%	127%
Research Potential	36	3	8%	6%	130%
Science in Society	226	49	22%	15%	147%
Marie-Curie Actions	3,027	586	19%	22%	90%
European Research Council	1,952	134	7%	5%	146%
Fusion Energy	4	3	75%	30%	250%
Nuclear Fission and Radiation Protection	76	23	30%	24%	127%
Total	**16,184**	**2,204**	**14%**	**11%**	**123%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

Figure 106 – UK and all FP7 participation-level success rates by Priority Area

Priority	UK participations in proposals	UK participations in projects	Participation success rate - UK	Participation success rate – all FP7	Ratio of UK success rates to FP7 success rates
Energy	830	107	13%	12%	109%
Environment (including Climate Change)	1,396	213	15%	12%	132%
Food, Agriculture, and Biotechnology	1,161	157	14%	12%	110%
General Activities (Annex IV)	15	3	20%	33%	61%
Health	2,676	474	18%	15%	120%
Information and Communication Technologies	5,092	579	11%	12%	95%
Nanoscience, Nanotechnology, Materials & new Production Technology	1,265	249	20%	19%	103%
Security	643	54	8%	9%	89%
Socio-economic sciences and Humanities	1,155	119	10%	7%	146%
Space	185	37	20%	22%	92%
Transport (including Aeronautics)	1,614	250	15%	16%	96%
Activities of International Cooperation	54	6	11%	19%	57%
Coherent development of research policies	10	4	40%	32%	124%
Regions of Knowledge	117	5	4%	13%	33%
Research for the benefit of SMEs	2,153	213	10%	9%	105%
Research Infrastructures	600	252	42%	39%	107%
Research Potential	42	3	7%	6%	114%
Science in Society	337	74	22%	14%	159%
Marie-Curie Actions	4,014	687	17%	14%	118%
European Research Council	2,110	140	7%	4%	164%
Fusion Energy	9	8	89%	81%	110%
Nuclear Fission and Radiation Protection	140	45	32%	30%	106%
Total	**25,618**	**3,679**	**14%**	**13%**	**111%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

C.12.3. UK success rates by instrument

Figure 107 shows the success rates of proposals with UK participation and compares these to the overall success rates for all proposals submitted to FP7, by instrument. It shows that UK proposal success rates were above the FP7 average in all 7 instruments, with the UK performing particularly well in relation to Support for Frontier Research, the main instrument employed by the European Research Council.

Figure 107 – UK and all FP7 proposal success rates by Instrument

	UK proposals	UK projects	Proposal success rate - UK	Proposal success rate – all FP7	Ratio of UK success rates to FP7 success rates
Research for the Benefit of Specific Groups	992	101	10%	9%	109%
Collaborative Project	8,643	1,012	12%	9%	125%
Coordination and Support Action	1,289	273	21%	17%	127%
Combination of CP & CSA	220	81	37%	30%	123%
Support for Frontier Research (ERC)	1,947	133	7%	5%	146%
Support for Training and Career Development of Researchers	3,025	585	19%	21%	94%
Network of Excellence	68	19	28%	24%	117%
Article 169 of the Treaty	-	0	-	-	-
Article 171 of the Treaty	-	0	-	-	-
Pilot Type B	-	0	-	-	-
Risk-Sharing Finance Facility	-	0	-	-	-
Total	**16,184**	**2,204**	**14%**	**11%**	**123%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

C.12.4. UK success rates by type of organisation

Figure 108 shows the success rates of proposals with UK participation and compares these to the overall success rates for all proposals submitted to FP7, by organisation type. It shows that UK proposal success rates were above the FP7 average in HEIs, Private commercial organisations, and Research organisations, with the UK HEIs performing particularly well.

Figure 108 – UK and all FP7 participation-level success rates by type of organisation

Organisation Type	UK participations in proposals	UK participations in projects	Participation success rate - UK	Participation success rate – all FP7	Ratio of UK success rates to FP7 success rates
Higher or secondary education est.	13,628	2238	16%	13%	126%
Private commercial	5,476	826	15%	14%	105%
Public body (excl. res. and educat.)	742	141	19%	19%	98%
Research organisations	2,210	414	19%	18%	106%
Others	1,458	60	4%	5%	86%
Total[50]	**25,618**	**3,679**	**14%**	**13%**	**111%**

Source: FP7 proposal data (E-CORDA, 1st November 2009)

[50] Figures include 12,628 participations in proposals of the overall FP7 and 2,104 participations in proposals of the UK where the activity type was unidentified

C.13. Comparing UK participation and success rates in FP7

The columns of Figure 109 present data on UK participation rates and success rates by priority area in FP7, relative to FP7 rates overall. These 'success ratios' have already been presented in Figure 106 but have this time been normalised and total to 100%. This will allow better comparisons with the participation ratios, which naturally total 100%. Each cell is marked as 'low', 'medium' or 'high' depending on the rank within the UK ratio with top 7 priorities in high, 8th-15th in medium and reminding 7 priorities in category 'low'. For example, the share of UK participation accounted for by the *Research Infrastructures* priority area is 8th highest and therefore is in the medium category.

UK participants have been doing particularly well (have 'high' participation rates as well as success rates) in Health, Socio-economic sciences and Humanities, Science in Society, Marie-Curie Actions and European Research Council. In Health, Marie Curie Actions and ERC are the participation ratios higher than their corresponding success rates and therefore we can say that the implied demand in these areas is high..

The UK has relatively low participation ratios in General Activities, Security, Space, Activities of International Cooperation, Coherent development of research policies, Regions of Knowledge and Research Potential

Figure 109 – Levels of UK demand: a comparison between UK's relative success and participation rates in FP7

Priority	**UK success ratio (SR) (Ratio of UK to FP7 success rates)**	**UK participation ratio (PR) (Ratio of UK to FP7 participation rates)**
Energy	Medium (99%)	Medium (79%)
Environment (including Climate Change)	High (119%)	Medium (96%)
Food, Agriculture, and Biotechnology	Medium (99%)	Medium (80%)
General Activities (Annex IV)	Low (55%)	Low (32%)
Health	High (108%)	High (119%)
ICT	Low (86%)	Medium (85%)
Nanotech	Medium (93%)	Medium (84%)
Security	Low (80%)	Low (77%)
Socio-economic sciences and Humanities	High (131%)	High (118%)
Space	Low (83%)	Low (71%)
Transport (including Aeronautics)	Low (87%)	Medium (84%)
Activities of International Cooperation	Low (52%)	Low (17%)
Coherent development of research policies	High (112%)	Low (54%)
Regions of Knowledge	Low (30%)	Low (13%)
Research for the benefit of SMEs	Medium (95%)	High (106%)
Research Infrastructures	Medium (96%)	Medium (100%)
Research Potential	Medium (103%)	Low (18%)
Science in Society	High (143%)	High (113%)
Marie-Curie Actions	High (107%)	High (149%)
European Research Council	High (148%)	High (163%)
Fusion Energy	Medium (99%)	High (104%)
Nuclear Fission and Radiation Protection	Medium (95%)	Medium (85%)
Total	**100%**	**100%**

Sources: Derived from FP7 participation data and FP7 proposal data (E-CORDA, 1st November 2009)

Appendix D UK participation in other actions related to FP7

D.1. UK involvement in FP7 evaluation panels

Involvement of national experts in the evaluation panels that assess proposals submitted to FP calls provide an opportunity to expand the experience base of UK academics and industrialists in the 'inner' workings of the Commission and its assessment procedures. Interviews with panel members carried out as part of previous FP evaluations have confirmed that the experience gained through this work provides valuable insight into how proposals are assessed, what kinds of information and arguments that evaluators are looking for, and the critical differences between successful and unsuccessful proposals. Such experience is stated to massively enhance the ability of participants to write successful proposals, increasing their level of success in the competitions and cutting down on abortive costs associated with the preparation of unsuccessful proposals.

Technopolis obtained data on the level of involvement of UK experts in the 2007 and 2008 evaluation panels that assessed proposals submitted under the first FP7 calls. The data were analysed in order to identify the total number of experts involved in each Priority Area of the programmes and the share of these that were from the UK. As a rough benchmark we can say that because the UK has obtained a 12% share of participations in FP7 to date we should look to see whether UK experts have made up a similar proportion of the experts assessing proposals.

The results of our analyses of UK participation in FP7 evaluation panels are shown in Figure 110. At an aggregate level it reveals that UK experts made up 10.7% and 10.6% of the 2007 and 2008 FP7 evaluation panels respectively, slightly below the level at which UK organisations are involved as participants in FP7 to date.

Figure 110 also reveals that UK experts have been involved at differing levels depending on the FP7 Priority Area in question. Aggregated across the two years, we can say that UK involvement in evaluation panels has been high in the following areas:

- Euratom (22.9%)
- Science in Society (14.7%)
- Health (12.8%)
- Information and Communication Technologies (12.0%)
- European Research Council (11.8%)

Conversely it can be seen that UK involvement in FP7 evaluation panels has been relatively low in the following areas:

- Research potential (4.3%)
- Regions of Knowledge & Activities of International Cooperation (6.8%)
- Socio-economic Sciences and Humanities (7.7%)
- ERA-NET (8.0%)
- Environment (8.3%)

CORDIS has also published a list of Expert Evaluators for the Ethics Review 2009-2010 where UK evaluators make up 11 out of a total of 112 experts (9.8%).

Figure 110 – UK involvement in FP7 evaluation panels

	2007 Evaluation Panels			2008 Evaluation Panels		
	All	**UK**	**UK share**	**All**	**UK**	**UK share**
Cooperation						
Energy	104	10	9.6%	327	34	10.4%
Environment	301	25*	8.3%	336	28	8.3%
ERA-NET	-	-	-	25	2	8.0%
Food, Agriculture & Biotechnology	415	44*	10.6%	325	39	12.0%
Health	1,353	173	12.8%	485	63	13.0%
Information & Communication Technologies	1,323	158	11.9%	342	42	12.3%
Nanosciences, Nanotechnologies, Materials & new Production Technologies	541	56*	10.4%	423	39	9.2%
Security	143	13	9.1%	133	10	7.5%
Socio-economic Sciences and Humanities	271	21*	7.7%	-	-	-
Space	96	8	8.3%	90	13	14.4%
Transport (including Aeronautics)	479	41	8.6%	344	34	9.9%
Capacities						
Research Infrastructures	80	10	12.5%	125	12	9.6%
Research for the benefit of SMEs	284	33	11.6%	351	31	8.8%
Regions of Knowledge & Activities of International Cooperation**	72	5*	6.9%	75	5	6.7%
Research Potential	89	4	4.5%	99	4	4.0%
Science in Society	73	11	15.1%	70	10	14.3%
People						
Marie-Curie Actions	809	81*	10.0%	1,322	115	8.7%
Ideas						
European Research Council	1,349	134*	9.9%	933	135	14.5%
Euratom						
Euratom	35	8*	22.9%	-	-	-
Total	**7817**	**835**	**10.7%**	**5805**	**616**	**10.6%**

Source: cordis.europa.eu/fp7/experts_en.html. * Includes some evaluators with dual nationality

D.2. UK involvement in the ERA-NET scheme

The ERA-NET Scheme was originally an action undertaken in the context of FP6 with the objective of stepping up the co-operation and co-ordination of research and innovation programmes carried out at national or regional level in the Member States and Associated States. The instruments used for implementing the ERA-NET Scheme were the Co-ordination Actions (CAs, for full fledged proposals) and the Specific Support Actions (SSAs, to prepare CAs).

DG Research data indicates that under the FP6 ERA-NET Scheme[51], UK participation – excluding coordinators – made up 6.76% of total participation. This would put the UK fourth, after Germany (11.35%), France (9.06%) and the Netherlands (7.97%). Using the same source and looking at coordinators by country, the UK should be listed fourth here too – 10.87% of selected proposals have a UK-based coordinator, again following behind Germany (21.74%), France (20.65%) and the Netherlands (15.22%).

While continuing to support actions begun during FP6, under FP7 ERA-NET has become more integrated in the Framework Programme. Mainly under Cooperation – but to some extent, under parts of the Capacities programme too. The 7th Framework Programme is in some cases also facilitating additional EU funding (up to one-third of the call budget can be provided by the Commission), known as ERA-NET Plus, to ERA-NET Actions "with high European added value"[52].

No data comparing UK ERA-NET participation vis-à-vis the EU-27 under FP7 has been found. However, data received from BIS recording UK participation in the ERA-NET scheme under FP7 suggest UK organisations have so far (2007-2009) submitted proposals for 29 ERA-NET actions, of which a UK coordinator led five proposals. Of these, 21 proposals have been successful, including three actions headed by a UK-based coordinator.

Quantity-wise, the highest number of proposals were submitted in 2007 and 2008 – 12 each, with fewer submissions in 2009 – five. In 2007, eight of the 12 proposals were successful (67%). In 2008, nine of 12 proposals were successful (75%), and in 2009 four out of five UK proposals were accepted (80%).

ERA-NET proposals submitted by UK organisations 2007-09 covered seven areas: General Activities (8 proposals), Environment (4), Food, Agriculture and Fisheries, and Biotechnology (4), Nanosciences, nanotechnologies, materials and new production technologies (4), Socio-economic sciences and humanities (4), Transport (3), and Health (2).

Of the submitted proposals, four ERA-NET actions were successful under: General Activities, Environment, and Food, Agriculture and Fisheries, and Biotechnology. Nanosciences, nanotechnologies, materials and new production technologies, and Transport saw three successful proposals each, while Socio-economic sciences and humanities submitted two successful proposals, and Health one.

A list of the organisations participating in the submitted proposals and supported ERA-NET actions from 2007-9 is shown in Figure 111.

[51] ERA-NET: Overview of proposals selected throughout 5 cut-off dates: 3.06.03, 2.03.04, 5.10.04, 2.03.05 and 4.10.05.
[52] cordis.europa.eu/fp7/coordination/eranet_en.html

Figure 111 – UK applicants and participants in ERA-NET actions 2007-9

UK organisation	Proposals submitted	Proposals accepted
Arts and Humanities Research Council	2	2
Biotechnology and Biological Sciences Research Council	2	2
Cancer Research UK	1	0
Department for Business, Enterprise and Regulatory Reform[53]	2	2
Department of Communities and Local Government	1	0
Department for Environment, Food and Rural Affairs	4	4
Department for International Development	1	1
Department for Transport	1	1
Department of Health	1	1
Economic and Social Research Council	2	1
Engineering and Physical Sciences Research Council	1	1
Environment Agency	1	1
Highways Agency	1	1
Invest Northern Ireland	2	1
Natural Environment Research Council	2	2
Northwest Regional Development Agency	1	0
Science and Technology Facilities Council	2	1
Scottish Enterprise	1	0
Scottish Executive	3	2
South West Tourism	1	1
Technology Strategy Board	3	3
University of Manchester	1	0
University of Sheffield	1	1

D.3. UK involvement in Article 169 actions

The idea behind Article 169[54] is to facilitate Community participation through joint implementation of R&D programmes on Member State level. In line with the ERA objectives – and building on the ERA-NET Scheme – the objective of Article 169 is to achieve increased co-ordination of research programmes in Europe.

The application of the Article should lead to an improved use of scarce resources by reaching critical mass. Initiatives should also address global issues, leading to common answers relevant to universal problems. Actions under the Article 169 initiative need to have a European added value, but not link directly to any of the 10 themes under the Framework Programme 7 Cooperation programme. They should also enhance the synergy between FP7 and non-FP7 activities, such as COST or EUREKA.

There are four Article 169 initiative funded under FP7. From two of these, some form of UK participation data have been obtained:[55]

D.3.1. Ambient Assisted Living Joint Programme (AAL)

The aim of the AAL Joint Programme is to improve the quality of life of older people and to strengthen the industrial base in Europe through the use of ICT.

[53] Now the Department for Business, Innovation and Skills
[54] Now Article 185 of the Lisbon Treaty
[55] Bonus is a Baltic Sea cooperation programme, and does not include the UK. EURAMET is the acronym for the European Association of National Metrology Institutes, which is a Regional Metrology Organisation of Europe, and responsible for the European Metrology Research Programme. Although the EMRP was originally supported through the ERA-NET Plus mechanism, the second stage is envisaged to be supported through Article 169 and is, according to its website, in its final stages of approval.

The AAL programme has released reports on its first two calls for proposals (AAL-2008-1 and AAL-2009-2).

Partner state statistics for the initial call (AAL-2008-1) is sparse, but roughly indicates the UK lies around average out of 23 partner countries for "number of partners per country". Out of a total of 23 projects funded under the first call, four projects included one UK organisation, while a fifth project was led by a UK coordinator, and included three UK participating organisations.

A total of 104 proposals, totalling 762 partners, were received in response to the second call (AAL-2009-2), of which UK partners numbered just under 40 (≈5%). Five proposals were led by UK coordinators (≈5%).

The data does not reveal the number of successful proposals, but does include a ranking of submitted proposals: 41 (=327 partner organisations) out of 104 applications were concluded to be 'positive' by the independent evaluators. The ranking suggests not all UK proposals were concluded to be positive. The UK had 15 organisations among these 327, i.e. 4.6%. Of the 41 positively ranked proposals, two were led by UK coordinators (4.8%).

D.3.2. Eurostars Programme

The Eurostars Programme, made up of 32 partner states, is specifically targeting SMEs. The programme funds collaborative market-driven R&D projects where SME participants have a prominent role.

The Technology Strategy Board, as the national UK contact, has published some data[56] on the 2008 call, which was the first call for proposals in which the UK participated. Only R&D intensive SMEs were eligible to receive funding in the UK; other partners would need to obtain funding from other sources.

The Eurostars 2008 call received a total of 317 proposals, of which 245 were eligible for ranking. The TSB states that 61 UK applicants submitted a total of 57 proposals (≈18%). Out of the 57 proposals, 17 had a UK lead applicant.

The data also suggests that the average UK project was just slightly shorter in duration compared with the average Eurostars project (26 months / 29 months). Likewise, UK projects had on average fewer partners (3.3 / 3.5) and also on average fewer countries partaking per project (2.2 / 2.5). The Netherlands, Italy, the Czech Republic, Denmark, France, and Germany were the most frequently cited UK partner countries.

Four UK projects could be found in the top 10 ranking, including the highest scoring project, which received 580 points out of a possible 600.

Funded UK projects could be said to be widespread, covering 11 sectors. Three sectors saw three funded projects each: electronics, industrial products / manufacturing and medical / health related sector.

As for regional breakdown, 46 of the 57 UK proposals were submitted through the East of England Development Agency (8 proposals), London Development Agency (16), Scotland (6), or South East England Development Agency (16). The Northwest Regional Development Agency and One North East were the only regions that did not submit any project proposals.

[56] A breakdown of the funded projects supported as a result of the Eurostars 2008 call for proposals is at: www.innovateuk.org/_assets/pdf/eurostars%2008%20call%20breakdown.pdf

D.4. UK involvement in European Technology Platforms

European Technology Platforms (ETP) are industry-led frameworks for co-operation that allow for private and public stakeholders to jointly agree on R&D priorities, timeframes and action plans on issues of importance to the future of Europe, and its longer term goals in relation to economic growth, competitiveness and sustainability. ETPs are envisaged to be influential public-private partnerships vis-à-vis the development of ERA and in helping the Framework Programme to better accommodate for industry – a number of ETPs have developed into Joint Undertaking initiatives, for example, ARTEMIS and ENIAC.

A 2008 Evaluation of the European Technology Platforms (ETPs)[57] indicated the average ETP consists of around 300 members, however usually only around 10% of these are core members. Membership ranges from large businesses, to SMEs, Universities, public bodies and NGOs.

The Fourth Status Report on European Technology Platforms 'Harvesting the potential' from August 2009[58] lists the development so far of the 34 ETPs active today. As the ETPs all have separate websites that publicise different types of information, little can be concluded on UK participation overall. Not all ETPs have published clear member lists. However, Figure 112 below is an attempt to show the number of UK actors active in ETPs today. The information on UK participants is very patchy, and so the numbers shown should by no means be taken as definitive or complete. However, they do indicate a good level of involvement of UK organisations where data is available. The relative level of involvement of UK academia versus UK industry is highly variable across the different ETPs, with industry involvement ranging from zero to very high (e.g. 33 UK companies involved in the Networked and Electronic Media (NEM).

Figure 112 – Overview of UK involvement in ETPs (not definitive)

ETP	UK participation
Advanced Engineering Materials and Technologies (EuMat)	2 Academia / R&D
Advanced Research and Technology for Embedded Intelligence and Systems (ARTEMIS)	Unclear
Advisory Council for Aeronautics Research in Europe (ACARE)	Unclear
European Biofuels Technology Platform (EBTP)	4 Academia / R&D, 1 Other
European Construction Technology Platform (ECTP)	Unclear
European Nanoelectronics Initiative Advisory Council (ENIAC)	Unclear
European Photovoltaic Technology Platform	Unclear
European Platform on Smart Systems Integration (EPoSS)	Yes, but exact number and actors involved unclear
European Platform on Sustainable Mineral Resources (ETP SMR)	Unclear
European Rail Research Advisory Council (ERRAC)	Unclear
European Road Transport Research Advisory Council (ERTRAC)	1 Academia / R&D, 1 Public body
European Space Technology Platform (ESTP)	1 Academia / R&D, 1 Public body, 12 Industry
European Steel Technology Platform (ESTEP)	Yes, but exact number unclear
European Technology Platform for Electricity Networks of the Future (SmartGrids)	1 Academia / R&D, 2 Industry, 1 Public body
European Technology Platform for Global Animal Health (GAH)	Unclear
European Technology Platform for Photonics (Photonics21)	Yes, but exact number and actors involved unclear
European Technology Platform for Sustainable Chemistry (SusChem)	Yes, but exact number and actors involved unclear
European Technology Platform on Industrial Safety (ETPIS)	11 Academia / R&D, 6 Industry, 1 Public body, 4 Other
European Technology Platform on Robotics (EUROP)	4 Academia / R&D, 7 Industry
European Technology Platform Waterborne	Unclear
European Wind Energy Technology Platform (TPWind)	2 Academia / R&D, 2 Industry, 2 Other

[57] Evaluation of the European Technology Platforms (ETPs), Final report, IDEA Consult, August 2008 ftp://ftp.cordis.europa.eu/pub/technology.../evaluation-etps.pdf
[58] ftp://ftp.cordis.europa.eu/.../technology-platforms/.../etp4threport_en.pdf

ETP	UK participation
Food for Life (Food)	Yes, but exact number and actors involved unclear
Forest-based Sector Technology Platform (FTP)	Yes, but exact number and actors involved unclear
Future Manufacturing Technologies (Manufuture)	2 Academia / R&D, 7 Industry, 1 Other
Future Textiles and Clothing (FTC)	1 Other
Integral Satcom Initiative Technology Platform (ISI)	6 Academia / R&D, 13 Industry, 2 Other
Mobile and Wireless Communications Technology Platform (eMobility)	1 Industry
Nanotechnologies for Medical Applications (Nanomedicine)	3 Academia / R&D
Networked and Electronic Media (NEM)	16 Academia / R&D, 33 Industry, 2 Public body, 4 Other
Networked European Software and Services Initiative (NESSI)	Yes, but exact number and actors involved unclear
Plants for the Future (PLANTS)	6 Academia / R&D, 1 Other
Sustainable Nuclear Energy Technology Platform (SNE-TP)	2 Academia / R&D, 2 Industry, 1 Other
Water Supply and Sanitation European Technology Platform (WSSTP)	4 Academia / R&D, 3 Other
Zero Emission Fossil Fuel Power Plants (ZEP)	Yes, but exact number and actors involved unclear

D.5. UK involvement in Joint Technology Initiatives

Joint Technology Initiatives (JTI) – set up under Article 171 of the EC Treaty[59] – are mechanisms for European public-private partnerships in key areas of industrial research that aim to increase European competitiveness and quality of life.

JTIs – some of which have developed out of ETPs (European Technology Platforms) – should make an impact on industrial competitiveness and growth, contribute with added value to European intervention, and have clear objectives and deliverables. They should also have committed financial resources from industry, be able to attract additional support from national and industrial funds, and contribute to broader European objectives such as benefits to society. Apart from having a work programme, JTIs should also deal with general aspects of research infrastructure, education, SME support and international collaboration. JTIs should have an open structure.

There are currently five JTIs operating:

- Aeronautics and Air Transport (Clean Sky)
- Embedded Computing Systems (ARTEMIS)
- Fuel Cells and Hydrogen (FCH)
- Innovative Medicines (IMI)
- Nanoelectronics Technology 2020 (ENIAC)

We have found very limited data revealing the extent of UK participation in the five JTIs. As the JTIs are independent entities there is no central source of information available. Data received from BIS has also been inconclusive when attempting to paint a broader picture and no attempts have therefore been made to compare UK participation with that of other Member States.

D.5.1. Aeronautics and Air Transport (Clean Sky)

Data from BIS suggests that roughly 55 proposals were submitted from UK organisations for the 2009 call. Out of these, 43 were recorded as having "passed evaluation". However, this does not necessarily mean 43 UK applications were funded.

Of the 43 positively viewed proposals, 11 stemmed from Higher Education Institutes. These were Brunel, Cardiff, Cranfield and Oxford Universities, Imperial College London, and the Universities of Manchester, Southampton and Westminster.

[59] JTI is a type of Joint Undertaking, which was established as a legal entity under the Treaty

Twenty-four proposals were submitted by private for-profit companies, including multiple from AeroTex UK, Cytec Engineered Materials, GE Aviation Systems Ltd, GKN and Aerospace Services Ltd. The remaining six were submitted by two research organisations: Aircraft Research Association Ltd and TWI Ltd.

D.5.2. Embedded Computing Systems (ARTEMIS)

The ARTEMIS website reveals that there have been two calls for proposals (2008 and 2009) under this initiative, and there is some data on successful proposals available for the 2008 call.

Out of 12 funded projects, UK partners are included in four.

The Open Group consortium[60] is the only participant in more than one project; they are part of both the CHARTER project (which also includes UK partner Artisan) and the CHESS project.

The CESAR project is notable as it includes five UK partners (out of 56): Airbus UK, Formal Software Construction Ltd, Oxford University, Quintec Associates (Thales Consulting and Engineering) and the University of Manchester.

The EMMON project has two UK partners: CSWT - Critical Software Technologies and Intesys.

D.5.3. Fuel Cells and Hydrogen (FCH)

Data from BIS: Some data on UK participation can be found from the 2008 and the 2009 FCH calls for proposals.

In the 2008 call, it appears five of 11 UK proposals submitted were viewed positively when evaluated ("passed evaluation"). These originated from: Ceramic Fuel Cells Ltd, Element Energy Ltd, Rolls-Royce Fuel Cell Systems Ltd, and the Universities of Birmingham and Reading.

In the 2009 call, 27 out of 47 UK proposals "passed evaluation". Centre for Process Innovation Ltd and Diverse Energy Ltd applied as coordinators. The majority of applicants stemmed from UK industry, i.e. were profit-seeking organisations, but a smaller number of HEIs, and two entities listed as research organisations (Centre For Process Innovation Ltd and the Health and Safety Executive) also submitted adequate proposals.

D.5.4. Innovative Medicines (IMI)

No information found on IMI site or elsewhere.

D.5.5. Nanoelectronics Technology 2020 (ENIAC)

No information found on ENIAC site or elsewhere.

[60] Listed as UK-based, however includes several other countries

Appendix E Questionnaire survey of FP6/7 participants

INTRODUCTION

This questionnaire is aimed at all UK participants in the European Union's Sixth and Seventh Framework Programmes (FP6/7).

The data collected through the survey will form an integral part of a study to detail the impact of the EU Framework Programmes on the UK that is being undertaken on behalf of the UK Department for Business, Innovation and Skills (BIS).

The overall objectives of the study are to determine the extent to which successive FPs have leveraged areas of UK strength and helped to introduce new areas of expertise, as well as to provide up-to-date evidence as regards the nature and extent of the impacts of UK participation. The outputs from the study will form one of several critical inputs to the UK objectives for and negotiations around FP8, and we would therefore ask all FP participants from the UK to complete the questionnaire.

When answering the questions we are asking respondents to represent the views of their research group or organisation as appropriate. We would expect most participants from HEIs, research institutes and large companies to answer on behalf of their research group, while participants from small businesses are more likely to answer from the perspective of their organisation as a whole. We would ask respondents to make their own choice as to what they consider an appropriate level at which to respond. Respondents may answer from their own personal perspective if they feel unable to talk on behalf of their organisation or research group.

The survey consists of 29 questions and we estimate that it will take around 15-20 minutes to complete. Your answers will be saved automatically, and you can leave the questionnaire at any time and return to it later via the URL contained in the email that we sent you. If you are unable or do not wish to answer any of the questions please leave these blank and move on to the next question.

We would be grateful if you could complete the questionnaire by **Friday 19th February 2010**.

All individual answers and comments will be treated as strictly confidential and non-attributable.

Thank you in advance for your participation and input to this study. If you have any questions or comments please do not hesitate to contact us via email on UKFP@technopolis-group.com

BASIC DETAILS

1. Please provide the following basic information:

Your name ☐

Organisation ☐

Research Group ☐

2. Which of the following best describes your field of research?

Mathematical sciences	☐
Physics and related sciences	☐
Chemistry and chemical engineering	☐
Materials science and mechanical engineering	☐
IT and computer science	☐
Environmental sciences (incl. earth sciences, marine sciences…)	☐
Life sciences (incl. biology, biotechnology…)	☐
Medical sciences	☐
Social sciences	☐
Humanities	☐
Other (please specify) ☐	☐

Within this area, what is your specific research field (e.g. particle physics, industrial sociology…)?

[ ]

3. Which of the following best describes the organisation to which you are affiliated

University / college	☐
Public research institute / centre	☐
Private research institute / centre	☐
Large company	☐
Small or medium sized enterprise (SME)	☐
Public authority / agency	☐
Other (please specify) [ ]	☐

RELEVANCE OF FP6 AND FP7

4. Please provide ratings for the following features of FP6 / FP7 from the perspective of your own organisation or research group's capabilities:

	Very low	Low	Medium	High	Very high
The relevance of FP6 research topics/priority areas and calls	☐	☐	☐	☐	☐
The relevance of FP6 instruments (e.g. IPs, STREPS, MCAs)	☐	☐	☐	☐	☐
The relevance of FP7 research topics/priority areas and calls	☐	☐	☐	☐	☐
The relevance of FP7 instruments (e.g. R&D collaborative projects, NoEs)	☐	☐	☐	☐	☐

5. To what extent have the FPs provided support for research topics / issues that have not been addressed by our national funding programmes?

Not at all	To a small extent	To a medium extent	To a large extent
☐	☐	☐	☐

6. Please describe briefly the main research topics / issues supported by the FPs that have not been addressed by our national funding programmes

[ ]

7. Are there specific areas of scientific and technological endeavour where the UK has particular strengths but which have not been (well) addressed by the FPs? If yes, please outline the most important areas below

[ ]

8. Conversely, are there research topics/ issues addressed by the FPs in your area where the UK is relatively weak, but where the FPs have helped to improve UK performance? If yes, please outline these areas below

[ ]

9. What do you consider to be the main 'added value' associated with participation in the FPs?

☐

DRIVERS AND MOTIVES OF PARTICIPATION

10. Please rate each of the following factors in terms of their importance as motives for your organisation or research group's participation in Framework Programme projects:

	Not important	Of little importance	Moderately important	Quite Important	Very important
a. To access research funding	☐	☐	☐	☐	☐
b. To develop and extend internal knowledge and capabilities	☐	☐	☐	☐	☐
c. To develop new or improved relationships or networks	☐	☐	☐	☐	☐
d. To address specific scientific or technical questions, problems or issues	☐	☐	☐	☐	☐
e. To access capabilities that do not exist in the UK (complementary expertise)	☐	☐	☐	☐	☐
f. To access research facilities / infrastructure that do not exist in the UK	☐	☐	☐	☐	☐
g. To share the costs / risks association with the project	☐	☐	☐	☐	☐
h. To tackle problems that have a European or international dimension	☐	☐	☐	☐	☐
i. To improve the coordination of research	☐	☐	☐	☐	☐
j. To provide training (e.g. for PhD students or early stage postdocs)	☐	☐	☐	☐	☐
k. To facilitate the mobility of researchers	☐	☐	☐	☐	☐
l. To develop new or improved tools, methods or techniques	☐	☐	☐	☐	☐
m. To develop new or improved commercial products or services	☐	☐	☐	☐	☐
n. To develop new or improved regulations or policies	☐	☐	☐	☐	☐
o. To create new or improved facilities or infrastructure	☐	☐	☐	☐	☐
p. Other (specify) ☐	☐	☐	☐	☐	☐

11. Which of the motives above were the most important drivers for your participation in FP6 and FP7 projects? *(please enter the relevant letters a-p)*

Most important ☐

Second most important ☐

Third most important ☐

IMPORTANCE OF R&D AND INNOVATION OUTPUTS

12. Please indicate the importance of each of the following types of output to your organisation / research group when participating in FP6/7 projects

	Not important	Low importance	Medium importance	High importance
a. Publications in refereed journals and books	☐	☐	☐	☐
b. Other publications	☐	☐	☐	☐
c. Newly trained / qualified personnel (e.g. MSc, PhD, postdocs)	☐	☐	☐	☐
d. Exchange of personnel (in or out)	☐	☐	☐	☐
e. Awards or prizes	☐	☐	☐	☐
f. Scientific conferences, seminars or workshops	☐	☐	☐	☐
g. New research grants	☐	☐	☐	☐
h. Invention disclosures	☐	☐	☐	☐
i. Patent applications	☐	☐	☐	☐
j. Patents granted	☐	☐	☐	☐
k. New license agreements	☐	☐	☐	☐
l. New or significantly improved tools, methods or techniques	☐	☐	☐	☐
m. New or significantly improved commercial products or services	☐	☐	☐	☐
n. New or significantly improved scientific or industrial processes	☐	☐	☐	☐
o. New or significantly improved technical codes or standards	☐	☐	☐	☐
p. New or significantly improved regulations or policies	☐	☐	☐	☐
q. New or significantly improved facilities or infrastructure	☐	☐	☐	☐
r. Other (specify) ☐	☐	☐	☐	☐

13. Which of the outputs above are the most important to your organisation / research group? (please enter the relevant letters)

Most important ☐

Second most important ☐

Third most important ☐

PRODUCTION OF R&D AND INNOVATION OUTPUTS

14. Please also indicate the extent to which your FP6 / 7 projects have successfully delivered each type of output to your organisation's or research group's satisfaction.

	Outputs delivered below expectations	Outputs delivered in line with expectations	Outputs delivered above expectations
a. Publications in refereed journals and books	☐	☐	☐
b. Other publications	☐	☐	☐
c. Newly trained / qualified personnel (e.g. MSc, PhD, postdocs)	☐	☐	☐
d. Exchange of personnel (in or out)	☐	☐	☐
e. Awards or prizes	☐	☐	☐
f. Scientific conferences, seminars or workshops	☐	☐	☐
g. New research grants	☐	☐	☐
h. Invention disclosures	☐	☐	☐
i. Patent applications	☐	☐	☐
j. Patents granted	☐	☐	☐
k. New license agreements	☐	☐	☐
l. New or significantly improved tools, methods or techniques	☐	☐	☐
m. New or significantly improved commercial products or services	☐	☐	☐
n. New or significantly improved scientific or industrial processes	☐	☐	☐
o. New or significantly improved technical codes or standards	☐	☐	☐
p. New or significantly improved regulations or policies	☐	☐	☐
q. New or significantly improved facilities or infrastructure	☐	☐	☐
r. Other (specify) ☐	☐	☐	☐

REALISATION OF TANGIBLE AND INTANGIBLE BENEFITS

15. Please indicate what scale of positive impact your FP6/7 participation has had (or is expected to have) on your own organisation / research group in terms of each of the following types of benefit:

	No impact	Low impact	Medium impact	High impact
Increased understanding / knowledge in existing areas	☐	☐	☐	☐
Increased understanding / knowledge in new areas	☐	☐	☐	☐
Increased scientific capabilities	☐	☐	☐	☐
Increased technological capabilities	☐	☐	☐	☐
Improved access to infrastructure / equipment	☐	☐	☐	☐
Improved planning or coordination of R&D	☐	☐	☐	☐
Improved ability or capacity to conduct R&D	☐	☐	☐	☐
Improved ability or capacity to provide training	☐	☐	☐	☐
Improved ability to attract staff / increased employment	☐	☐	☐	☐
Improved relationships and networks	☐	☐	☐	☐
Increased mobility of researchers	☐	☐	☐	☐
Improved career development of researchers	☐	☐	☐	☐
Improved business opportunities	☐	☐	☐	☐
Improved competitive position nationally	☐	☐	☐	☐
Improved competitive position internationally	☐	☐	☐	☐
Increased income or market share	☐	☐	☐	☐
Enhanced reputation and image	☐	☐	☐	☐
Other (specify)	☐	☐	☐	☐

16. What advice would you give to other UK participants on how to maximise the benefits they derive from FP projects?

☐

EXPLOITATION OF PROJECT RESULTS

17. Please indicate the extent to which your FP6 / 7 project results have been used in the following ways:

	Not at all	To a small extent	To a large extent	Unsure
Exploited by UK researchers in follow-on research	☐	☐	☐	☐
Exploited by UK companies	☐	☐	☐	☐
Exploited by UK policymakers	☐	☐	☐	☐
Exploited by European researchers in follow-on research	☐	☐	☐	☐
Exploited by European companies	☐	☐	☐	☐
Exploited by European-level policymakers	☐	☐	☐	☐
Exploited by researchers from outside the EU in follow-on research	☐	☐	☐	☐
Exploited by companies from outside the EU	☐	☐	☐	☐
Exploited by policymakers from outside the EU	☐	☐	☐	☐

18. Can you give any concrete examples of how your FP project results have influenced or impacted upon policy development?

COSTS AND BENEFITS OF PARTICIPATION

19. Overall, how have the costs and benefits associated with your own organisation / research group's participation in FP6 / 7 projects balanced out?

(+3) Benefits outweigh costs	☐
(+2)	☐
(+1)	☐
(0) Costs equal benefits	☐
(-1)	☐
(-2)	☐
(-3) Costs outweigh benefits	☐

Please explain the main reasons why the costs and benefits have this balance.

PROJECT PARTNERS AND YOUR ORGANISATION'S ROLE IN THE PROJECT

20. Please provide the following information about the partners in your FP6 and FP7 projects

The average number of partners in each of your FP6 and FP7 projects

The proportion of those partners that are new (i.e. no previous collaboration)

The proportion of new partners that you have worked with after the FP project (or expect to in the future)

21. Please estimate the proportion of your project partners that might be considered world class in relation to the following areas:

	0-24%	25-49%	50-74%	75-100%
Their scientific / technological competences	☐	☐	☐	☐
Their equipment, instruments and tools	☐	☐	☐	☐

22. Overall, to what extent do you believe that the FPs have improved university-business collaboration and interaction, over and above what might have prevailed otherwise?

	Not at all	To a small extent	To a large extent	Unsure
Within the UK during the project	☐	☐	☐	☐
Beyond the UK during the project	☐	☐	☐	☐
Within the UK following the project	☐	☐	☐	☐
Beyond the UK following the project	☐	☐	☐	☐

23. To what extent has your organisation / research group typically played each of the following roles in its FP6/7 projects?

	No role	Minor role	Major role	Primary role	Not applicable
Defining the objectives of the project	☐	☐	☐	☐	☐
Defining the content and scope of the project	☐	☐	☐	☐	☐
Defining the size and membership of the consortium	☐	☐	☐	☐	☐
Negotiating the IPR arrangements	☐	☐	☐	☐	☐
Research training	☐	☐	☐	☐	☐
Carrying out research	☐	☐	☐	☐	☐
Disseminating project results / knowledge transfer	☐	☐	☐	☐	☐
Exploiting the results of the project	☐	☐	☐	☐	☐
Planning / coordinating future research	☐	☐	☐	☐	☐

STRATEGIES FOR INFLUENCING THE FRAMEWORK PROGRAMMES - NATIONALLY

24. To what extent do you feel that National agencies / representatives have been successful in influencing the form and content (thematic priorities, instruments) of FP6/7 in line with UK interests?

	Not at all	To a small extent	To a medium extent	To a large extent
FP6 priority areas / calls	☐	☐	☐	☐
FP6 instruments (e.g. IPs, STREPS, MCAs)	☐	☐	☐	☐
FP7 priority areas / calls	☐	☐	☐	☐
FP7 instruments (E.g. NoEs)	☐	☐	☐	☐

Please describe any ways in which National agencies / representatives could enhance the extent to which they influence FP planning to increase its relevance to UK research communities

☐

FEEDBACK ON FP6/7 ADMINISTRATION / REPORTING

25. Based on your experience of applying to and participating in FP6/7, please indicate your level of satisfaction with the following aspects:

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Information provided to prospective applicants about how to apply	☐	☐	☐	☐	☐
FP application procedures	☐	☐	☐	☐	☐
FP proposal evaluation and selection procedures	☐	☐	☐	☐	☐
FP contract negotiation procedures	☐	☐	☐	☐	☐
Monitoring procedures	☐	☐	☐	☐	☐
Reporting procedures	☐	☐	☐	☐	☐
Management arrangements within your project	☐	☐	☐	☐	☐
Procedures for end of project assessment / completion	☐	☐	☐	☐	☐
Mechanisms for payment of EC financial contributions	☐	☐	☐	☐	☐
Processes for dissemination and exploitation of project results	☐	☐	☐	☐	☐
Evaluation at national and EC levels	☐	☐	☐	☐	☐

26. Please provide below any comments you have on the EC's administrative mechanisms and reporting procedures. We are particularly interested in specific recommendations you have for how processes can be improved

RECOMMENDATIONS

27. What changes would you like to see introduced for FP8 that would enhance UK involvement and the benefits derived?

28. Please describe any ways in which national or institutional support for prospective FP applicants could be improved

29. Finally, please provide any other comments or suggestions you would like to make

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Appendix F Interview Guide

A - Alignment of EU RTD Framework Programme with national priorities

To what extent has research funded through the EU RTD Framework Programmes (FPs):

1. Been aligned with your research and innovation priorities (yes or no; if yes, specify; request evidence; ask how it came about; and what the consequences have been)?
2. Leveraged areas of UK strength (yes or no; if yes, specify; request evidence; ask how it came about; and what the consequences have been)?
3. Been carried out by the UK's leading researchers and research organisations (yes or no; if yes, specify; request evidence; ask how it came about; and what the consequences have been)?
4. Filled important gaps not addressed by national programmes (yes or no; if yes, specify; request evidence; ask how it came about [why were there important gaps in national portfolio]; and what the consequences have been)?
5. Helped to introduce new areas of expertise (yes or no; if yes, specify; request evidence; ask how it came about; and what the consequences have been)?
6. Increased capacity in emerging areas where UK will need to work with partners in order to have sufficient impact?
7. Or, conversely, concentrated on areas that are less important to you (yes or no; if yes, specify; request evidence; ask how it came about; and what the consequences have been)?
8. Has UK-FP strategic alignment changed through successive FPs, FP4 to FP7?
9. Is it important to your organisation that FP should align with your priorities (yes or no; if yes, why is it important; what would happen if things were not aligned; what would 'misaligned' look like)?
10. Will your organisation be doing more or different things to improve alignment with FP8?
11. Should the UK overall be doing more to improve alignment and leverage?
12. What practicable actions would you recommend BIS consider?

B - Impacts of UK involvement in FPs[61]

13. What have been the principal impacts of UK involvement in successive FPs within your area of interest?
14. What is the principal source of value added, as compared with national programmes: what kinds of benefits do you see which would have been unlikely to arise otherwise?
15. Has the FP had a meaningful impact on UK research:
    - The topicality / relevance of research agendas?
    - The quality / scale of research infrastructure available?
    - The quality of research / research outputs?

[61] We will need to unpack these broad-brush questions about impacts and added value, by checking off each point in the respondent's narrative against our more detailed checklist (below). And then by asking about any type of impact that did not get covered in the response to the initial question. For all points or questions, the interviewer will need to obtain a basic yes or no [or don't know or not applicable]. If the answer is no, ask whether they would have hoped to see impact of this kind and why they think it hasn't arisen. If yes, ask the respondent to elaborate and give specific examples to help us understand what they mean and what has happened. Ask respondents if they have any data / objective evidence to support their views. We also need to explore why / how the FP has produced these sorts of benefits and whether national programmes might have produce similar results. Lastly, we need to ask for referrals to any obvious success stories we might consider as case studies.]

- The knowledge / skills of researchers, public and private?
- The international connectedness of UK researchers?
- The careers of UK researchers?
- The global profile / influence of UK researchers?

16. Has the FP had an impact on the volume of national investment in research and innovation (public or private) in your area?
17. Has the FP had an impact on the volume or quality of Intellectual Property being created in your areas of interest?
18. Has the FP had an impact on the quality or frequency of interaction amongst businesses and public sector research organisations in your area?
19. Has there been any evident impact on the persistence of these sorts of behavioural changes, relating to knowledge transfer / innovation?
20. Has the FP triggered subsequent research or development, which would otherwise not have happened?
21. Has FP had an impact on the innovativeness of UK businesses active in your areas of interest?
22. Have there been any notable innovations, which track back to FP?
23. Has the FP had an impact on other aspects of the performance of UK businesses, productivity, competitiveness, overseas market access, exports, etc?
24. Has the FP had an impact on inward investment to the UK by research-active businesses, in your areas of interest?
25. Has FP had an impact on policy development and allocation of resources across priorities?
26. Has there been any noticeable change in the kinds of impacts, across successive FPs?
27. Do you see a case to re-balance the mix of impacts that derive from the FP, should its priorities and instruments be optimised around an alternative set of objectives?
28. Which FP funding mechanisms are most closely identified with success in your areas of interest?
29. Has the FP strengthened UK research and researchers through the 'best with best' criterion, exploiting the intrinsic ability of an international programme to address a larger pool of internationally outstanding scientists than a typical national programme?

Appendix G List of interviewees

G.1. Programme officials, experts and National Contact Points

Figure 113 lists 29 interviewees, covering programme committee members, experts and NCPs.

Figure 113 – Programme committee members, experts and NCPs

FP Area	FP sub-programme	Contributor	Org	FP role
Cooperation	Health - Lead	Mark Palmer	MRC	Programme manager
Cooperation	FAFB - Agriculture	Mike Collins	DEFRA	Programme manager
Cooperation	FAFB - Food	Patrick Miller	FSA	Programme manager
Cooperation	ICT	Lee Vousden	BIS	Programme manager
Cooperation	FAFB - Biotechnology	Robert Porteous	BIS	Programme manager
Cooperation	Energy - Lead	Steve Martin	DECC	Programme manager
Cooperation	Space - Lead	Robert Canniff	BNSC	Programme manager
Cooperation	Environment	Mike Collins	DEFRA	Programme manager
Cooperation	Socioeconomic Sciences & Humanities	Caroline Baylon	AHRC	Programme manager
Cooperation	Socioeconomic Sciences & Humanities	Stephen Struthers	ESRC	Programme manager
Cooperation	Security - Lead (and NCP)	Brian Hampson	HO	Programme manager
Ideas	ERC - Lead	Mike Davies	BIS	Programme manager
People	MCA	Nicholas Harrap	UKRO	Programme manager
Capacities	SMEs - Lead	Chris Reilly	BIS	Programme manager
Capacities	Research Infrastructures	Peter Fletcher	STFC	Expert
Capacities	Research Infrastructures	Martin Ridge	BIS	Programme manager
Cooperation	Creative industries	Alex Stanhope	TSB	Expert
Cooperation	Resource efficiency	John Whitall	TSB	Expert
Cooperation	ICT	Mike Biddle	TSB	Expert
Cooperation	ICT	Zoe Lock	TSB	Expert
SME specific		James Clipson	TSB	Expert
SME specific		Graham Mobbs	TSB	Operations Manager
Int Cooperation		Peter Dirken	TSB	UK national contact point
FP (overall)		David Golding	TSB	Agency lead
Cooperation	Transport – policy	Matt White	DOT	Programme manager
Cooperation	Transport – land	Finella McKenzie	Ind.	NCP
Cooperation	Transport – marine	Cliff Funnell	Ind.	NCP
Cooperation	Transport – air	Peter Joyce	BIS	Programme manager
Capacities	Science in Society	Adele Campbell	ESRC	Expert

G.2. Key participants in FP6 and FP7

We interviewed **24** 'key' academic, industrial and public sectors participants in FP6 and FP7 (see Figure 114 below). These individuals were selected based mainly on the number, scale and diversity of the actions in which they have been involved. Efforts were also made to include people from a range of different organisation types, ensuring that the most active organisations and individuals from each area were included where possible.

Figure 114 – FP6/7 participants

Thematic area	Organisation	Type	Name	Notes
IST/ICT	QinetiQ	REC	Chris Pickering	FP6 participant - multiple projects
			Colin Harper	FP6 participant - multiple projects
SME actions	TWI Limited	REC	Heidi Dyson	FP6/7 participant - multiple projects
Aero/space	Rolls Royce Plc	IND	David Bone	FP6 participant - multiple projects
Aero/space + Env	Johnson Matthey Plc.	IND	Alan Herbert	FP6/7 participant - multiple projects
Security	Forensic Science Service	PUB	Cecilia Buffery	FP7 participant
Environment	Fisheries Research Services	RI	Alejandro Gallego	Participant - NoEs/STREP
Health / biotech	Forsite Diagnostics Ltd	IND	Christopher Danks	FP7 participant - multiple projects
Health / biotech	Stem Cell Sciences UK Ltd	IND	Timothy Allsopp	FP6 coordinator - multiple projects
Health / biotech	Genome Research Limited	RI	David Davison	FP7 participant - multiple projects
IST/ICT	BMT Limited	PUB	Rory Doyle	FP6/7 coordinator - multiple projects
Mobility	Unilever UK Central Resources Limited	IND	Guy Savill	FP6 coordinator - multiple projects
			Henk de Jong	FP6 coordinator - multiple projects
Mobility	John Innes Centre	RI	Nicholas Brewin	FP6 coordinator - multiple projects
Nano	University Of Leicester	HEI	Peter Farmer	FP6 participant - multiple projects
Nano	CVD Technologies Limited	IND	David Sheel	FP7 participant - multiple projects
Nano	Institute Of Nanotechnology	PUB	Sergey Gordeyev	FP7 participant - multiple projects
R&I	Targeting Innovation Ltd.	IND	Caroline Gray-Stephens	FP6 coordinator - multiple projects
Research infrastructures	Science And Technology Facilities Council	RI	Robert McGreevy	FP6 coordinator - multiple projects
SME actions	UK Health & Environment Research Institute	RI	Paul Tranter	FP7 participant - multiple projects
			Simon Fawcett	FP7 participant - multiple projects
Energy	BGS	REC	Nick Riley	FP6/7 participant - multiple projects
Environment	POL	REC	John Huthnance	FP6/7 participant - multiple projects
Environment	CEH	REC	Neil Runnalls	FP6/7 participant - multiple projects
Totals	**21 Organisations**		**24 individuals**	

Technopolis Ltd
3 Pavilion Buildings
Brighton BN1 1EE
UK
T +44 1273 204320
F +44 1273 747299
E info@technopolis-group.com
www.technopolis-group.com