Evaluation of Framework Programme 6 In Ireland

December 2009

Forfás

Evaluation of Framework Programme 6 in Ireland

Acknowledgments

This report is substantially based on research carried out by Technopolis Group on behalf of Forfás. Forfás would like to fully acknowledge the quality of their work.

Many people and organisations contributed to the production of this report. Particular thanks are due to all the questionnaire respondents and to the FP6 participants and members of the Irish science and technology policy community who agreed to be interviewed. Thanks are also due to many of the staff of public sector bodies such as Forfás; the Office of Science and Technology; the Department of Enterprise, Trade and Employment; Enterprise Ireland; and the European Commission.

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Executive Summary

This report sets out the results of an evaluation of Ireland's involvement in Framework Programme 6 (FP6), carried out by Technopolis Group. The study was contracted and managed by Forfás and was overseen by a steering group representing the Office of Science and Technology (OST), Enterprise Ireland (EI), Industrial Development Agency - IDA Ireland (IDA), Higher Education Authority (HEA), Irish Universities' Association (IUA), Irish Research Council for the Humanities and Social Sciences (IRCHSS), Science Foundation Ireland (SFI) and Forfás.

The results of the study have shown that Ireland's participation in FP6 was strong overall, and that its public and private research communities have played an active role in the Programme, deriving significant benefit as a result. FP6 was considered to be of high relevance to Irish researchers. The programme's Priority Areas and Instruments were rated as an improvement on those employed in FP5, and proved a good fit with most researchers' requirements. However, demand for participation as measured by Irish participation in proposals was lower than might have been hoped, particularly within the Life sciences Priority Area.

Success rates within the competition were well above FP6 averages overall, and were particularly high in the Food quality and safety, Sustainable development, Research infrastructures and Euratom areas. Irish research institutes and public sector bodies enjoyed the highest success rates, while industry's were much lower than for the other main groups of actors. Unsuccessful applicants have gained a good understanding of why their proposals were not supported, and many have taken steps to take their ideas forward through other support mechanisms or subsequent FP calls.

Irish participants were awarded a total of €199 million in FP6 funding, an increase in real terms but the same share of the total that was achieved in FP5. The share of FP6 funding awarded to Irish participants was in line with Ireland's share of GDP and its contribution to the EU budget, was significantly above its share of GNP and was very high in relation to the size of its population. Funding allocations to Irish participants were above the average amounts awarded during FP6 as a whole, driven mainly by higher than average levels of funding being achieved by Ireland's Higher Education Institutes (HEIs).

Participant numbers and participation levels were slightly lower in FP6 than in FP5. A combination of high success rates but falling levels of participation suggests that there is scope for further increasing demand among Irish research communities for participation in the Framework Programmes. Significant increases in national funding issued by the HEA, SFI and other agencies during the course of FP6 appear to have strengthened some actors' desire and ability to participate. However, it is clear that in other cases national funding has (understandably) diverted attention away from FP participation in the short term, with some research teams giving greater priority to the setting up of national research infrastructure and projects than to FP6 participation. It is expected, however, that the increased capacity and capabilities developed through national funding can and will strengthen participation in future Framework Programmes among all groups of actors.

Irish organisations took part in all priority areas of FP6, and made use of all of the main instruments. In absolute terms participation levels and funding were highest in the Information society technologies (IST) and Human resources & mobility (HRM) areas. However, in comparison with other countries Ireland performed most strongly in the Food quality & safety, HRM, and Horizontal research involving Small & Medium-sized Enterprises (SMEs) areas.

Irish participants have played a very active role in the projects, and Irish coordination rates were well above FP6 averages. The FP6 priorities and instruments received positive ratings from

participants. Irish participants expressed reasonably high levels of satisfaction with FP6 administrative processes and procedures, and the balance of opinion was that these were better in FP6 than in FP5. Irish participants made good use of the support available during FP6 and rated the assistance received very highly.

A comparison of the motives for participation in Framework and the results achieved has shown that the Framework Programmes are effective at delivering the kinds of outputs and benefits that participants have sought. The formation of new networks and the exchange of knowledge and expertise were the primary motives for participation, along with a desire to access research funding. The primary benefits came in the form of improved relationships and networks, increased knowledge and capabilities (both scientific and technological), and enhanced reputation and image. FP participation has helped to strengthen and support participants' own research strategies, enabling them to extend their capabilities and pursue new lines of research. As a result, the benefits of FP6 participation have outweighed the costs for the vast majority of Irish participants.

The evaluation of FP6 has investigated early views on FP7, and the results are also positive, with most Irish actors considering FP7 priorities and instruments to be as relevant or of higher relevance than those of FP6. Ireland's new National Support Network (NSN) introduced for FP7 has attracted significant praise, and the research communities appear to be making good use of the support on offer. Ratings of the main service providers and the assistance received are extremely positive, and there are some early indications to suggest that Ireland's participation rates may be higher under FP7 than FP6.

Ireland's success rates are already high, and so the major challenge in the short term is to increase the extent of demand for FP participation. While the significant increases in national funding issued by the HEA, SFI and other agencies during the course of FP6 have undoubtedly helped to strengthen national Research & Technological Development (RTD) capabilities and capacity, it was perhaps unreasonable to expect to see an 'immediate' increase in Framework participation at the same time as the national funding was being absorbed. However, it is essential that in the longer-term, national investments in infrastructure and capabilities are used as a platform for strengthened participation in international RTD initiatives.

We therefore recommend that the national funding agencies reaffirm the importance of FP participation and ensure that all of the major recipients of national funding are aware of and take seriously their responsibilities to leverage national money against other funding sources[1]. As a priority the non-involvement of key research groups and companies in FP *proposals* should be targeted. In parallel, the national funding agencies should ensure that appropriate incentive systems are in place, which encourage and give sufficient credit for FP participation. This would appear to be most needed in the Life sciences area where Irish participations in proposals was much lower than we might have expected.

We also recommend that the national funding agencies and their key constituents begin to develop strategies with regard to FP participation, assessing national research strengths and priorities and linking these to FP priorities and opportunities. It seems that some of the key players within the research base and the NSN already have a good understanding of where Ireland has been making the

[1] Some national funding programmes such as the Programme for Research in Third-Level Institutions (PRTL)I have now set explicit targets in this regard. All successful applicants to PRTLI Cycle 4, regardless of size of award, are required to leverage 15% of the total PRTLI Exchequer investment (capital and recurrent) from non-Exchequer sources over the period of PRTLI Cycle 4 investment (this is subject to the Department of Finance's guidelines and National Eligibility Rules for Expenditure co-financed by the European Regional Development Fund (ERDF) in 2007-2013).

most of the available opportunities and where it has not. Such 'tacit' understanding should be underpinned by a more formal analysis, and then converted into a series of documented strategies as to how and where FP participation can be enhanced in the future. These strategies should form the basis for improved 'positioning' of the Irish research and industrial communities with respect to Framework participation, the establishment of EU partnerships and the influencing of future policy directions.

The Commission itself is moving to take more of a policymaking role, increasingly setting wider RTD priorities and agendas in cooperation with the member states. As such there is increasing 'policy space' for countries like Ireland to interact with and influence overall EU-level RTD strategies. New programming instruments provide opportunities for Ireland to take a stronger role in policy coordination and to influence more of the European agenda. The findings in this report suggest that Ireland is already beginning to play such a role, but a more concerted effort may be needed to ensure that the strategies of other actors do not crowd out Ireland's national interests. Active participation in the Joint Technology Initiatives (JTIs)and Joint Programming Initiatives (JPIs) and the negotiation of RTD agendas with other Member States is therefore essential if Ireland is to build on the recent investments it has made in its RTD base.

In addition, we make the following more specific recommendations for strengthening Ireland's participation in the Framework Programmes, most of which should be taken up by the national funding agencies through the NSN:

- Increase efforts to influence and provide early warnings of FP calls, with a stronger role in 'behind the scenes' negotiations in relation to FP priorities, and with National Delegates occupying a more central role within the NSN
- Provide increased support for identifying partners and building consortia, with increased help in building links with established EU players and increased incentives for intra-Ireland collaboration, particularly where Irish participants are in a coordinating role
- Provide increased levels of support from 'experienced campaigners' in reviewing draft proposals and advising on critical success factors
- Encourage increased levels of participation by Irish researchers within the FP evaluation process, in order to enable an improved understanding of how it operates and how to maximise chances of success
- Increase the use of dedicated (professional) management support, to assist in the development of proposals, drawing up of contracts, and management of large-scale projects
- Improve the balance of support provision, with a better regional distribution and a greater focus on support to industry
- Provide more flexible forms of financial assistance, including the option to claim travel grants retrospectively and selective provision of matched funding in strategically important areas to support FP participation
- Strengthen the promotion of the support available, particularly to less established and new participants in order to ensure that the assistance is given to those who most need it
- Evaluate on an ongoing basis the effectiveness of the support provision, in order to understand whether the increased investment is producing the desired results, overall and at the level of the different elements, particularly the financial supports

The current economic climate brings forth the prospect of ever more serious cutbacks in national funding for Research & Development (R&D), and it is therefore vital that the upgrading of Irish

research capabilities that has been taking place over the last decade can be exploited and further developed through FP participation. The measures set out above should provide an improved basis for ensuring that this can happen.

1. Introduction

This is the short version from an Evaluation of Framework Programme 6 (FP6) in Ireland report, which was carried out by Technopolis Group on behalf of Forfás.

The overall aims of the study were to assess Ireland's performance in relation to FP6, identifying the extent to which Irish organisations were involved and the benefits they have derived. The study was also asked to canvass early views on FP7 and on the new National Support Network (NSN).

Particular emphasis was placed on the relevance of FP6 to Irish organisations, the extent to which new actors engaged in the programme, the leverage from Irish research organisations in assisting other Irish actors to become involved, the added value of FP6 in contributing to national research, development and innovation (RD&I) output, and the suitability of support mechanisms in place at national and EU levels.

The report provides a summary of the main findings from the evaluation and is organised into three further sections as follows:

- **Section 2** describes the methodology employed in carrying out the evaluation. It sets out briefly the main requirements for the study as set out in the terms of reference issued by Forfás. We then go on to describe the principle methods used to carry out the evaluation
- **Section 3** presents the main findings from the study. We report on the relevance of FP6 to Irish researchers, the strength of demand for FP6 participation, and Ireland's success rates in securing FP6 funding support. Ireland's participation levels in different areas of the programme are analysed and discussed, as are its patterns of collaboration with other countries. We then go on to report on the drivers and motives for FP participation, the outputs and benefits delivered, and the wider impacts of FP6 projects. Participants' ratings of the costs and benefits of participation are presented, and Irish researchers' satisfaction with FP6 administrative processes and FP6 support structures are discussed. We then present early feedback on FP7, focusing on the relevance of the programme and the operations of the new National Support Network (NSN). Finally, we discuss Irish FP participation in the EU policy context, discussing the implications of evolving EU and national policy changes over recent years
- **Section 4** presents our main conclusions and recommendations

The information set out in this report is a condensed version of the full report submitted to Forfás and which is available on the Forfás website www.forfas.ie .

2. Methodology

2.1 Study terms of reference

The terms of reference for the study set out the objectives of the evaluation, which were as follows:

- To assess the added value of FP6 in contributing to national research, development and innovation (RD&I) output
- To assess the relevance of FP6 to Irish organisations, and the extent to which new actors engaged in the programme
- To assess the leverage (or lack thereof) from Irish organisations in encouraging and assisting participation in FP6
- To assess the suitability for participants of support mechanisms in place at national and EU levels

It was also required that the evaluation address a range of other issues, including patterns of participation, the relative performance of Ireland and the benefits derived, plus views on the relevance of instruments, awareness of support and feedback on administrative procedures. The study was also required to provide recommendations on enhancing Ireland's participation in future FPs and the benefits obtained.

2.2 Methodological approach

2.2.1 Analysis of Irish participation in FP6 projects

The data used for the analysis of Ireland's participation in FP6 was extracted by Forfás from the European Commission's e-corda database and supplied to the study team. This data was compared with published data on FP6 participation to confirm that the analyses presented are consistent, and some data cleaning (standardising names, filling information gaps, etc.) was required in order to improve the accuracy of results. A range of analyses was then undertaken to describe the nature and extent of Irish participation in FP6, focusing on the questions set out in the terms of reference.

2.2.2 Analysis of Irish participation in FP6 proposals and success rates

The European Commission also provided a database on Irish participations in FP6 proposals, which contained just over 4,000 records and included information on: the call and priority area; the name, activity type and contact details of the Irish participants; and the number of partners in each proposal. It did not, however, give any further details concerning the proposals (title, acronym, instrument, funding, etc.), meaning that it was not possible to carry out certain types of analysis. Nor was it possible, based on this data, to provide information on the reasons why proposals had been unsuccessful. Duplicate and non-Irish records were removed from the database prior to analysis, leaving a total of 3,846 Irish participations in FP6 proposals. It was also necessary to clean the organisation names. The data was then analysed, within the limitations of the dataset provided, focusing on questions set out in the terms of reference.

2.2.3 Questionnaire survey of FP6 participants

Technopolis developed a questionnaire to be sent to Irish participants in FP6 projects. The questionnaire was designed to address the various requirements of the study terms of reference, and focused on areas that could not be answered through the analysis of participation data or that would not be better addressed through the programme of interviews (see below). It included questions on the relevance of FP6, the impact of national funding on participation levels, participants' motives for becoming involved, delivery of outputs, benefits and impacts realised, and use and views on FP6 and FP7 support.

The FP6 database provided data on 524 individual participants, of which 423 had participated in one project and 101 had participated in multiple projects[2]. In addition, Forfás was able to identify contact names and email addresses for a further 29 participants. The initial sample of participants targeted by the survey was therefore 553.

The questionnaire was implemented on-line using a professional survey facility and a request email was sent to participants in early February 2009. We estimate that this failed to reach 29 people (due to undeliverable messages and 'opt-outs'), leaving us with a pool of 524 possible respondents. A total of 153 respondents provided a useable return, giving an overall response rate of 29%. Responses provided a reliable sample from which to draw conclusions, notwithstanding a slightly lower level of feedback from industry and a slight over-representation of projects with Irish coordinators. Data was analysed in order to determine the pattern of responses for each question and, where appropriate, separate analyses were carried out by organisation type or by other sub-groups.

2.2.4 Questionnaire survey of unsuccessful FP6 applicants

Technopolis also developed a questionnaire to be sent to unsuccessful FP6 applicants. The questionnaire was designed to collect information on Irish participants' roles in the unsuccessful proposals, the reasons why the proposals were not successful, the fate of the unsuccessful ideas, and the impact of failure in the competition on subsequent application rates. The questionnaire also explored unsuccessful applicants' use and views on FP6 and FP7 support mechanisms.

The European Commission data on unsuccessful proposals with Irish involvement contained 3,846 records (after duplicates and non-Irish applicants were removed), within which we identified 1,224 unique individuals with properly formed email addresses that we believed, based on a cross-check with the main FP6 participation database, had not participated in FP6. The survey of unsuccessful applicants was launched in May 2009, with email requests sent to all of the identified individuals. Taking into account undeliverable messages, the final pool of unsuccessful applicants targeted was ~1150.

In total, 110 useable responses were received, representing a response rate of ~10%. Due to data limitations, the overall profile of unsuccessful applicants and the extent to which respondents are representative of all applicants cannot be reliably determined. However, the spread of responses by organisation type is a close enough match to the overall FP6 participation profile to be considered a sufficiently balanced sample from which to draw conclusions. The pattern of responses were analysed for each question, with comparisons in some cases being made between those who were unsuccessful with all of their proposals and those who had been unsuccessful with only some.

[2] It was agreed that those involved in more than one project would be asked only to complete one copy of the questionnaire, with their response based on the project that best exemplified their work

2.2.5 Interviews with key actors

It was agreed that the evaluators would interview 30 key individuals from within the Irish research and innovation system. Forfás developed a preliminary list of 26 interview targets, including senior researchers, representatives of public funding agencies and FP6/7 support providers. In addition, key FP6 participants, Higher Education Institute (HEI) research office representatives and other individuals were identified from participation and applicant databases and steering group suggestions. The final list included ~20 support providers /representatives of national research funding agencies and ~30 key researchers /FP participants.

The interviews were intended to be semi-structured and an interview guide was developed based around the key questions to be addressed by the study, and focused on issues that could not easily be addressed through the participation analysis and surveys.

In the final event we interviewed 30 individuals, of which 13 were support providers / representatives of national research funding / policy agencies and 17 were senior researchers / FP6 participants from HEIs, research institutes and industry. Notes were taken during interviews and then transferred to a central database for analysis. Due to the semi-structured nature of the interviews, it was not the intention to analyse the results in any quantitative way. Instead the views and suggestions put forward on each broad issue were compiled into an overall response and presented at various points in our report to support other data and evidence.

2.2.6 Interviews with major beneficiaries of national research funding

Although not part of the formal terms of reference for the study, it was agreed that the study team would seek to establish the extent to which the major recipients of national research funding in the period 2000-6 had participated in FP6, in order to help understand the relationship between this funding and FP participation. It was also agreed that we would attempt to speak with some researchers that had been identified as major recipients of national research funding, but who did not appear in the FP6 participant database, in order to establish whether they had participated in FP6, to determine the reasons why not (if not) and to determine whether national funding had acted as a barrier. Each major national funding agency provided information on the main recipients of research funding in the period and we identified those researchers (~10 per funding body) that had received the major awards or greatest overall shares.

Most of the beneficiaries were confirmed as having participated in FP6, but those who could not be matched with the FP6 database were approached in order to clarify the situation. We were only able to reach a small number of these individuals, but all confirmed that they either: (i) had participated, but were not (for whatever reason) named within the database, (ii) had applied but were unsuccessful, (iii) are employed at a senior (director) level and no longer named as PIs on proposals, or (iv) were out of the country during the application stages of FP6. All of the people we spoke with confirmed that they or (for directors) their institution have applied to FP7.

2.2.7 Analysis and reporting

Analysis of results was carried out throughout the study. An interim report setting out progress and preliminary results was circulated in early 2009 and discussed at a steering group meeting later that month. Following completion of all data collection and analysis, a draft final report was prepared and submitted to Forfás in mid 2009. A final steering group was held in July and a final version of the main evaluation report (>150 pages) was prepared and

submitted to Forfás in late 2009. The main findings, conclusions and recommendation from the study were then summarised to produce this condensed report.

3. Results

3.1 Introduction

In this section we present a summary of the main results of the evaluation. The full, detailed results from the study are presented in a separate report, which can be obtained from the Forfás website, www.forfas.ie.

3.2 The relevance of FP6 to Irish researchers

Interviews carried out with key FP6 participants, support providers and funding agencies confirmed FP6 as having been of high or good relevance to Irish participants. The FP6 priorities and instruments were a good fit with most researchers' requirements and have helped to facilitate their involvement (rather than act as a barrier to it). The FP6 priority areas were considered to be both a little broader and easier to understand than FP5 priorities (which were based more around socio-economic objectives than research areas) and this has helped to ensure that most project ideas have been able to find a suitable home within the overall FP6 structure. As we might expect, the changes introduced in FP6 did have a negative impact on some participants, but on the whole the changes were viewed positively rather than negatively.

Our survey of Irish participants in FP6 confirmed that in the majority of cases FP6 priority areas and instruments were as relevant or more relevant than those employed in FP5. Of those that expressed an opinion, 58% rated FP6 research topics to be more relevant than those in FP5 and 54% rated the FP6 instruments to be more relevant than those employed in FP5. Even the new large-scale instruments Networks of Excellence (NoEs) and Integrated Projects (IPs) introduced for FP6 were rated as more likely to have increased researchers' ability to participate than to have decreased it.

3.3 Ireland's participation in FP6 proposals

European Commission data on Ireland's participation in proposals submitted to FP6 indicated that levels of demand have been reasonable, with almost 700 Irish organisations being named in just over 3,000 proposals. Ireland participated in 5.4% of all proposals submitted to FP6, accounting for 1% of the participations in proposals overall.

An analysis of Ireland's participation in proposals by FP6 Priority Area reveals that Irish demand was highest in the Human resources and mobility (HRM), Support for the coordination of activities, Information society technologies (IST), and Food quality and safety areas. Proposal participation rates were lowest in the Euratom, Specific measures in support of international cooperation, Aeronautics and space, Life sciences and Sustainable development areas. The low demand for participation in the Life sciences area is notable given Ireland's recent investment in this field.

Industry applicants came forward in the greatest numbers, with 440 companies applying to FP6, making up almost two-thirds of Ireland's total applicant base. Industry, however, accounted for only a quarter of Ireland's participations in proposals. This latter indicator was dominated by the HEIs, which accounted for over half (56%) of Ireland's participations in proposals but made up only 5% of its applicant base. Research institutes constituted 5% of

Irish applicants and accounted for 6% of proposal participations, while 'Other' organisations (mainly public sector bodies) made up 27% of the applicant organisations but only 12% of the participations in proposals. These data reflect the different scale of demand from different types of organisations, with the Irish HEIs submitting an average of 65 proposals each, while Irish companies submitted just two each on average.

Most FP6 participants (52% of those that responded) indicated that their organisation or research group had increased the number of proposals submitted to FP6 in comparison with FP5, while a significant minority (38%) stated that there had been no change. Only 10% signalled that they had decreased the number of applications submitted. These data appear to suggest that demand for FP participation by Irish organisations is increasing, but they do not tell us anything about trends in demand among organisations that (i) participated in FP5 but chose not to apply to FP6 or (ii) applied to FP6 but were unsuccessful with their proposals. In the absence of data on Irish involvement in FP5 proposals (which was not available) it is hard to determine whether Irish demand increased or decreased from FP5 to FP6 in absolute terms.

3.4 Ireland's success rates in applying to FP6

3.4.1 Ireland's success rates

Based on the numbers of proposals submitted and the numbers of these that were supported, Ireland's overall proposal-level success rate in FP6 was calculated at 23%, significantly above the average success rate for FP6 proposals as a whole (18%). Ireland's participation-level success rate was also 23%, again significantly above the overall average for FP6 (19%). These figures confirm the strong performance of Irish proposals within the competition as a whole.

Table 1 – Ireland's application & participation success rate in FP6, by organisation type

	Organisations & (participations) in FP6 Proposal	Organisations & (Participations) in FP6 Project	Applicant & (Participation) success rate
HEIs	33 (2160)	18 (475)	55% (22%)
Research Institutes	35 (236)	20 (76)	57% (32%)
Industry	440 (992)	133 (168)	30% (17%)
Other	190 (451)	101 (171)	53% (38%)
Total	**698 (3839)***	**272 (890)**	**39% (23%)**

There were, however, markedly different success rates for the different groups of actors that have participated in FP6. Irish research institutes and 'others' enjoyed participation success rates of 32% and 38% respectively, while Irish HEIs were successful in 22% of cases where they were named in proposals. Irish companies were successful with only 17% of their proposal

participations, a success rate of just one in six. (Table 1) Further analysis has shown that while over half of the HEIs, research institutes and 'other' types of organisation that applied were successful in securing at least one project, less than a third of the industry applicants had any success at all within the competition. Unfortunately the European Commission has not published any data on success rates by type of participating organisation so it is not possible to determine whether, for example, Irish industry's FP6 proposal success rates were above or below those of industry as a whole (i.e. all countries).

Irish proposal success rates were above the FP6 average in 12 of the 17 FP6 Priority Areas, with Ireland performing particularly well in the Food quality and safety, Sustainable development, Research infrastructures and Euratom areas, where Irish success rates were more than double the FP6 averages. Irish proposal success rates were well below average in the Support for international collaboration, Research and innovation and Science and society areas.

3.4.2 Reasons for unsuccessful proposals

Our survey of unsuccessful applicants revealed a very broad range of reasons as to why their FP6 proposals were not successful in obtaining support. **The most significant reason for proposals not succeeding was simply an insufficient budget to support all proposals that passed the required quality threshold**, an issue that affected almost a third of the failed proposals. The next most significant reason was a lack of detailed information and explanation; something which if addressed may have helped the proposal over the threshold. A significant minority of proposals fell down on their overall written quality, or suffered from issues relating to the end-use or exploitation of project results. Other proposals failed due to problems with the team - either the strength of the consortium, the quality of the team, having too many partners, having too few partners, or the overall management structure.

Most of the reasons behind non-success of proposals are to a large extent within the control of the consortium preparing the proposal, with the possible exceptions of a lack of available budget and duplication with another proposal. However, even in these cases preparing a higher quality proposal, with a strong team, clear goals, and which fits squarely within the scope of the call will increase the chances that the proposal wins out over other competing offers. There appears therefore to be scope for Ireland to further increase its proposal success rates, building on what is already a very strong position.

3.4.3 The fate of unsuccessful FP6 proposals

In most cases the unsuccessful FP6 project ideas have been put on hold as no alternative sources of funding can be found. However, in a significant minority of cases proposals have been resubmitted to other sources of funding, successfully in most of these cases. Other proposals have been slimmed down, broken into smaller parts or otherwise adjusted and then submitted to subsequent FP6 or FP7 calls or to other national or international programmes. In some cases this approach has been successful, in other cases not.

3.5 Ireland's participation in FP6

3.5.1 Numbers of participants

A total of 272 Irish organisations were involved in funded FP6 projects, constituting approximately 1.3% of all FP6 participants. This was 14% below the number of Irish organisations involved in FP5 (n=318) and 42% below the number involved in FP4 (n=467). This downward trend in participant numbers is a concern, though it is hard to determine whether the decline reflects a wider trend in FP participation overall. Participant numbers are hard to calculate accurately due to problems with how organisation names are coded in the FP databases, with the same organisation often being listed under multiple different names.

As we have found in other national FP evaluations, the level of 'churn' or turnover in Ireland's FP participant base appears to be high from one FP to the next. Only around a quarter of the Irish organisations involved in FP5 participated in FP6, and only around a third of Ireland's FP6 participants were involved in FP5. This means (in real terms) that 242 FP5 participants either did not apply or were not successful in FP6 and 182 'new' organisations came into FP6 to take their place, obviously leading to a net fall overall.

The highest level of churn was found within the long tail of mainly industry and 'other' participants that typically have only one or two participations in any given FP and either struggle or decide not to participate again. We identified just 88 Irish organisations that participated in both FP5 and FP6, and within this set there was a 'core' group of 33 organisations that had five or more participations across the two programmes. Ireland's FP6 participations (and indeed its FP6 funding) are very highly concentrated within this 'core' group of organisations, collectively accounting for two-thirds of Irish participations and over three-quarters of FP6 funding. Table 2 below summarises the comparison of Irish FP6 participation to FP5 participation.

Table 2: Comparison of Irish FP6 participation to FP5

Activity	Irish FP6 participation	% of FP6 total	Irish FP5 participation	% of FP5 total
Projects	714	7.1%	864	5.3%
Participations	890	1.2%	1042	1.3%
Organisations	272	1.3%	318	*
Funding	€199 million	1.25%	€148 million	1.2%

3.5.2 Numbers of participations

The total number of Irish participations in FP6 was 890, out of a total of 74,400. Ireland's participations therefore constituted 1.2% of the total for all countries involved in FP6. The numbers of Irish participations in FP4 and FP5 were 1,489 and 1,042 respectively, so once

again we see a general downward trend, with a sharp fall in participations from FP4 to FP5 (down by 30%) and a smaller but still significant fall from FP5 to FP6 (down by 15%).

While the falls in Irish participation numbers appear to be significant, the data do not reveal anything about the more general trends in FP participation from FP4 to FP5 and then to FP6. Ireland secured 2.1% of all FP4 participations, 1.3% of all FP5 participations, and 1.2% of all FP6 participations. The fall from FP4 to FP5 was therefore highly significant, but the fall from FP5 to FP6 was much smaller in proportionate terms, and may be largely accounted for by an increase in the number of countries participating and in particular by a growing involvement by some of the new Member States.

It should be noted that Ireland's fortunes over successive FPs have been influenced by a range of factors, in particular the 'Objective 1' (developing country) status that was lost in 2001 as the Irish economy strengthened. The objective 1 status had made Ireland a favoured partner, particularly during FP4 when the Commission was trying to ensure strong participation on the part of the less well-developed economies. Participants from other EU countries expected that inclusion of Irish partners would help to enhance their chances of success within the competition, and at the same time the continued low levels of national funding meant that EU funding remained very important to Irish researchers. This resulted in a 'spike' in Irish participations during FP4 that remains unsurpassed to this day. However, most interviewees consider FP4 involvement levels to have been 'artificially' high and not a true reflection of Ireland's 'natural' research strengths or ability to participate more generally in the FPs. The integration of new Member States and the loss of the 'Objective 1' status are seen by some to have been the primary reasons as to why FP5 and FP6 participation levels have not been the same as those enjoyed in FP4, although increases in national funding over the same period may also have diverted attention away from FP participation in the short term.

3.5.3 Involvement in FP6 projects

Irish organisations were involved in 714 projects, out of a total of 10,058, so Ireland participated in 7.1% of all FP6 projects. Ireland was involved in 1,187 FP4 projects and 864 FP5 projects, so once again we see a general downward trend, with a sharp fall in project involvement rates from FP4 to FP5 (down by 27%) and a smaller but still significant fall from FP5 to FP6 (down by 17%).

However, when Ireland's project involvement rate is expressed in proportionate terms a somewhat different picture emerges. Ireland participated in 7.1% of all FP4 projects, 5.3% of all FP5 projects and 7.1% of all FP6 projects, so while there was a downward trend in Ireland's project involvement rate from FP4 to FP5 this fall was fully reversed in FP6, with Ireland again participating in 7.1% of the projects. There has been a general downward trend in the numbers of projects supported by successive FPs, but with increased 'average' numbers of partners within each project (and increased volumes of funding per project). This trend helps to explain why Ireland's project involvement rate (from FP5 to FP6) has increased even though its share of participations has declined.

3.6 Funding received by Irish organisations

3.6.1 Amount of EC funding received

Irish organisations received a total of €199 million in FP6 funding, out of a total allocation of €16.7 billion. Irish organisations therefore received 1.2% of all FP6 funding.

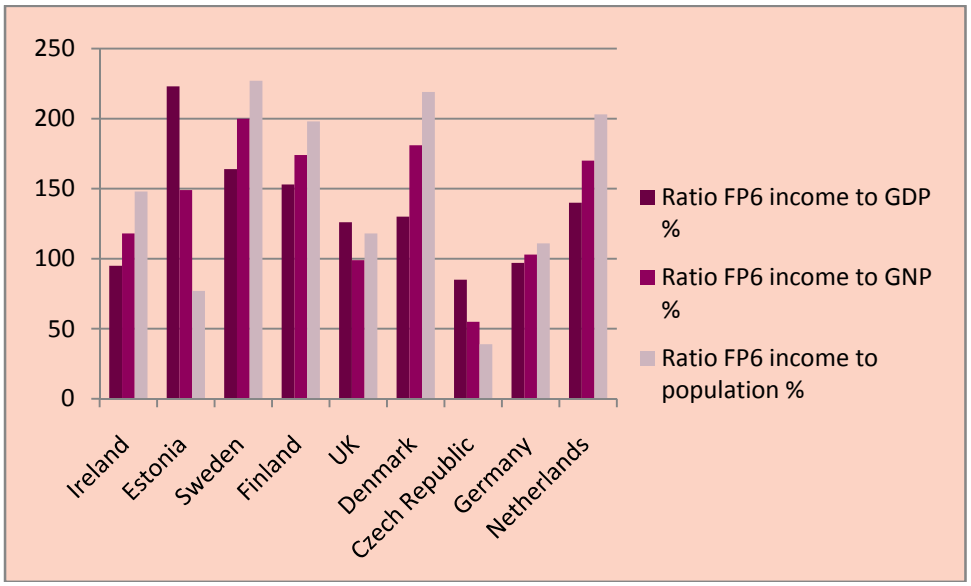
The total funding allocation equates to an average of just over €720k per participant, which is 14% higher than the average received by all organisations across FP6 as a whole. The average volume of funding awarded per Irish participation was just over €220k, almost exactly the same as the overall EU average.

The absolute volume of FP6 funding received by Irish organisations was 34% higher than the amount secured from FP5 (€148 million) and also slightly higher than the amount received through FP4 (€191 million). However, changes to the scale of successive FPs mean that in proportionate terms the share of FP funding allocated to Irish organisations has remained static over the last two FPs (1.2% in both cases), and significantly below the 1.9% share of the total received under FP4.

3.6.2 FP6 funding in comparison with Ireland's contribution to the EU budget

Each country contributes to the general EU budget in proportion to its Gross Domestic Product (GDP). Taking Ireland's share of EU-25 GDP (2005) as a proxy for its contribution to the EU budget revealed that Ireland's 'target' level of income from FP6 would have been €209 million or 1.38% of EU-25 funding, calculated on a *juste retour* basis. Ireland in fact received €199 million, or 1.32% of EU-25 funding, slightly below the target figure but only very marginally so. However, this level of performance placed Ireland only 15th out of the EU-25 in terms of its FP6 funding to GDP ratio, arguably lower than the level that Ireland would have hoped to obtain.

Figure 1: Ireland's FP6 income to GDP, GNP and Population ratio as a % for selected countries.



Other performance metrics, however, suggest that Ireland's performance has actually been rather strong. For example, we know that Ireland's GDP figures have been boosted over the past two decades by foreign direct investment in manufacturing and international services, with a large number of foreign-owned multinational companies (MNCs) setting up operations in Ireland. While these MNCs contribute to Ireland's GDP figures, many have not, heretofore, carried out research and development (R&D) operations in Ireland and so have not participated in the Framework Programmes. For this reason, some commentators suggest

that the share of FP funding realised by Ireland in comparison with its Gross National Product is a more suitable measure of performance, as this limits the effects of the MNCs. Ireland's 'target figure' for FP6 income if it were to have been in direct proportion to its GNP contribution would have been €168 million, so Ireland has in fact received a funding share significantly greater (i.e. 18% higher) than expected. Based on the ratio of FP6 funding received to GNP share, Ireland was ranked 11th out of the EU-25, a much better performance than obtained when considering GDP.

We have also considered Ireland's performance in FP6 relative to the size of its population. Ireland's population in 2004 was 0.89% of the EU-25 total, meaning that its 'target' income from FP6 based on its share of the population would have been close to €135 million. Ireland's total allocation of €199 million is clearly well above this figure (47% higher), again suggesting that Ireland's performance overall can be considered to be strong. Ireland was ranked 7th out of the EU-25 in terms of the ratio of its share of FP6 funding allocations to its share of EU-25 population. Figure 1 above highlights Ireland's funding in comparison to a selected number of EU-25 countries. The full report has the details for all 25 countries.

3.6.3 Amount of EC funding by type of organisation

Irish HEIs received €135 million in funding, 68% of Ireland's total and far higher than the overall share of FP6 funding allocated to HEIs across FP6 as a whole (37%). Research institutes received just 6% of the funding (~ €13 million), which is well below the share assigned to research institutes through FP6 as a whole (32%). This finding is explained by the small number of research institutes within the Irish innovation system in comparison with most other EU countries. Industry received just over €27 million in funding, 14% of Ireland's total and below the FP6 average of 18%. The other types of participants received €23 million in funding, 12% of Ireland's total, which is in line with the share allocated to 'Others' across FP6 as a whole.

These figures suggest that there has been a concentration of Ireland's FP6 funding within the HEIs, with this group accounting for more than two-thirds of the funding despite accounting for only around half of the participations. The funding per HEI participation was found to be 23% higher in Ireland than the average assigned to HEIs across FP6 as a whole. This 'gain' has been offset by lower than average allocations to Irish research institutes, industry and 'other' participants, with funding amounts per participation that were 34%, 25% and 21% below the FP6 averages for each of those groups respectively. These findings provide a strong indication that the HEIs have occupied more central roles in the FP6 projects than the other groups.

3.7 Patterns of participation

3.7.1 Participation by different types of actor

HEIs and research institutes have each constituted 7% of Irish participants, lower than the FP6 averages of 14% and 19% respectively. Irish industry accounted for 49% of Ireland's participants, a higher share in proportionate terms than the FP6 average of 36%. The remaining participants were mainly public sector agencies and NGOs, making up 37% of Ireland's participant base, again above the FP6 average of 31% for these 'other' types of organisation. It has been noted that some industry participants were wrongly categorised in the database as 'others' and so Ireland's true share of participants from Industry is estimated

to be closer to 59% and 'others' closer to 28%. This indicates a very good level of involvement by Irish companies, as compared to FP6 averages.

Analysis of the number of FP6 participations accounted for by each group paints a rather different picture, with Irish HEIs accounting for 53% of Ireland's participations, well above the FP6 average of 36%. Research institute participations accounted for just 9% of Ireland's total, well below the FP6 average of 28%. Industry participations accounted for 19% of Ireland's total, the same share as the FP6 average. However, it should be noted that misclassification of Irish industry as 'Others' within the FP6 database may mean that industry participations constituted a higher share of Ireland's total than is witnessed more generally across FP6. 'Other' actors made up 19% of Ireland's participations, slightly above the FP6 average of 17%. These figures further support the conclusion that Ireland's participations are highly concentrated within the HEI sector, though participation by HEIs and research institutes in combination has been very close to average EU levels. Participation rates by industry and 'other' types of organisation have been at or slightly above FP6 averages for all countries. Table 3 below summarises the breakdown by organisation type for participant, participation and funding.

Table 3: Breakdown of Ireland's share in FP6 by organisation type

Activity Type	Number (& % share) of participants - Ireland	Estimated number (& % share) of participants - FP6 overall	Number (& &share) of participations - Ireland	Number (& % share) of participations – FP6 overall	Irish funding allocations (€m) (& % share)	Total FP6 funding allocations (€m) (& % share)
HEIs	18 (7%)	3,006 (14%)	475 (53%)	26,490 (36%)	135.1 (68%)	6,156 (37%)
Research Institutes	20 (7%)	4,055 (19%)	76 (9%)	20,621 (28%)	12.8 (6%)	5,221 (32%)
Industry	133 (49%)	7,561 (36%)	168 (19%)	13,908 (19%)	27.6 (14%)	3,027 (18%)
Other	101 (37%)	6,550 (31%)	171 (19%)	12, 371 (17%)	23.2 (12%)	2,123 (13%)
Total	272 (100%)	21,173 (100%)	890 (100%)	73,390 (100%)	198.7 (100%)	16,528 (100%)

These findings suggest that there is no particular problem with any of the four group's participation levels in FP6, when structural differences are taken into account. It is notable that Irish industry's share of Irish participations is at or above the FP6 average level, so any concern about low levels of industry involvement need to be applied to Framework as a whole rather than to Ireland's participation within it.

3.7.2 Irish participation in FP6 Priority Areas

Ireland participated in all (17) Priority Areas of FP6. (Table 4) In absolute terms, participation rates and funding allocations were highest in the Information society technologies (IST) and

Human resources and mobility (HRM) areas, with over 100 projects, over 150 participations and in excess of €40 million in funding achieved by Ireland in each area.

Table 4: Projects, participations and EC funding by Priority Area

Priority	# Projects (% share of FP6 total) Rel to Irish share	# Participations (% share of FP6 total) Rel to Irish share)	EC funding (€ million) (% share of FP6 total) Rel to Irish share
1. Life sciences, genomics and biotechnology	49 (8%) ⇒[3]	54 (0.8%) ⇓	14.0 (0.6%) ⇓
2. Information society technologies	122 (11%) ⇑	156 (1.1%) ⇒	42.5 (1.1%) ⇒
3. Nanotechnologies and nanosciences	55 (12%) ⇑	78 (1.3%) ⇒	20.8 (1.4%) ⇑
4. Aeronautics and space	23 (10%) ⇑	31 (0.9%) ⇓	8.5 (0.8%) ⇓
5. Food quality and safety	40 (22%) ⇑	65 (2.0%) ⇑	14.4 (1.9%) ⇑
6. Sustainable development	54 (8%) ⇒	8 (10.8%) ⇓	16.5 (0.7%) ⇓
7. Citizens and governance	25 (17%) ⇑	28 (1.4%) ⇑	3.0 (1.2%) ⇒
Policy support / S&T needs	48 (9%) ⇑	55 (1.2%) ⇒	7.0 (1.2%) ⇒
Horizontal research activities - SMEs	73 (15%) ⇑	103 (1.9%) ⇑	7.3 (1.5%) ⇑
Support for international cooperation	3 (1%) ⇓	3 (0.1%) ⇓	1.1 (0.3%) ⇓
Research and innovation	13 (5%) ⇓	15 (0.8%) ⇓	1.4 (0.6%) ⇓
Human resources and mobility	153 (3%) ⇓	162 (1.9%) ⇑	54.5 (3.2%) ⇑
Research infrastructures	21 (14%) ⇑	23 (1.2%) ⇒	3.8 (0.5%) ⇓
Science and society	4 (2%) ⇓	5 (0.5%) ⇓	0.5 (0.7%) ⇓
Support for the coordination of activities	25 (25%) ⇑	25 (2.1%) ⇑	2.7 (0.9%) ⇓
Development of R & I policies	1 (5%) ⇓	1 (0.6%) ⇓	0.2 (1.1%) ⇒
Euratom	5 (6%) ⇒	5 (0.4%) ⇓	0.6 (0.3%) ⇓
Total	**714 (7.1%)**	**890 (1.2%)**	**198.7 (1.2%)**

[3] Arrows (⇑⇒⇓) have been used to symbolise Ireland's performance in each area compared to its overall performance in FP6 of 7.1%. e.g. 8% in the life sciences area is 'close to average' (⇒) while 12% in nanotechnology projects is 'above average '(⇑)

A comparison was made between the profile of Irish participation and funding allocations in each FP6 priority area and overall FP6 participation and funding profiles. It showed that Ireland has performed most strongly in the following areas: (i) Food quality and safety, boosted by very high performance by Irish research institutes and 'other' public sector organisations, (ii) Horizontal research involving SMEs (small & medium-sized enterprises), with strong performance by Irish industry, research institutes and 'Others', and (iii) Human resources and mobility, with a very strong performance by Irish HEIs and industry. The areas of weakest performance were (i) Life sciences, (ii) Aeronautics and space, (iii) Sustainable development, and (iv) Support for International cooperation.

Given Ireland's ambitions over the past decade to significantly expand its capabilities in the Life sciences and Information Society Technologies (IST) areas, a stronger (comparative) performance in these two priorities, especially the former, might have been expected. Our analyses indicate that the main reason for low performance in the Life science area was limited demand, as success rates for Irish applicants were above average for that area. A different situation exists for the IST area, where demand was high but success rates were low, leading to an 'average' level of participation. The impact of Science Foundation Ireland (SFI) funding on FP involvement in these two areas remains unclear, and participation levels in FP7 should provide a better indication of the growing strength of Ireland's research capabilities in these two domains.

Further analysis of participation data revealed that Irish HEIs performed particularly strongly in the Nanotechnologies and Nanosciences area, and in the Human resources and mobility programme. Irish industry performed extremely well in the Horizontal research activities – SMEs area, and also in Human resources and mobility. Irish research institutes performed exceptionally well in the Food quality and safety area, and strongly in the Policy support / S&T needs area, the Horizontal research activities – SMEs area, and the Support for the coordination of activities area. 'Other' Irish organisations did well in Food quality and safety, Citizens and governance, Policy support / S&T (science & technology) needs, the Support for coordination of activities and Horizontal research activities – SMEs areas.

3.7.3 Irish participation in FP6 Instruments

Ireland participated in all (10) main FP6 instruments. (Table 5) In terms of numbers alone Irish participation was highest for Specific Targeted Research Projects (STREPs), Marie Curie Actions (MCAs), and Integrated Projects (IPs), with over 100 projects, over 150 participations and in excess of €40 million in funding achieved by Ireland for each type of instrument.

In comparative terms (i.e. compared to overall FP6 participation profiles) Ireland has performed most strongly in relation to the following Instruments: (i) Co-operative Research Projects (CRAFT), boosted by high levels of Industry, research institute and 'Others', (ii) Marie Curie Actions (MCAs), with Irish Industry and to a lesser extent HEIs performing very well, (iii) Collective Research Projects, due to high levels of industry and 'Other' participations, and (iv) Coordination Actions, with Irish research institutes and 'Others' performing strongly.

Irish participation in the Networks of Excellence (NoEs), Integrated Projects (IPs), STREPs and Specific Support Actions (SSAs) were lower than might have been expected, given overall FP6 participation profiles. All types of Irish participants had a relatively weak showing in the IPs, NoEs and STREPs, while HEIs and 'Others' had relatively low involvement in SSAs. Industry and research institutes performance was strong in the SSAs.

Table 5: Projects, participations and EC funding, by Type of Instrument

Instrument	Projects (% share of FP6 total) Rel to Irish share	Participations (% share of FP6 total) Rel to Irish share	EC funding (€million) (% share of FP6 total) Rel to Irish share
Networks of Excellence (NoEs)	36 (21%) ⇑[4]	46 (0.9%) ⇓	9.87 (0.8%) ⇓
Integrated Projects (IPs)	121 (17%) ⇑	177 (1.0%) ⇓	60.82 (0.9%) ⇓
Specific Targeted Research Projects (STREPs)	166 (7%) ⇒	205 (1.0%) ⇓	49.41 (1.1%) ⇒
Coordination Actions (CAs)	85 (17%) ⇑	106 (1.5%) ⇑	8.36 (1.4%) ⇑
Specific Support Actions (SSAs)	72 (5%) ⇓	84 (1.0%) ⇓	6.33 (0.7%) ⇓
Co-operative Research Projects (CRAFT)	51 (3%) ⇑	68 (1.8%) ⇑	4.52 (1.4%) ⇑
Collective Research Projects (CLR)	19 (22%) ⇑	32 (1.9%) ⇑	2.34 (1.6%) ⇑
Integrated Infrastructure Initiatives (I3)	4 (36%) ⇑	4 (1.2%) ⇒	0.63 (0.3%) ⇓
Specific Actions to Promote Research Infrastructures (II)	10 (12%) ⇑	11 (1.2%) ⇒	2.26 (0.7%) ⇓
Marie Curie Actions (MCAs)	150 (3%) ⇓	157 (1.9%) ⇑	54.14 (3.2%) ⇑
Total	714 (7.1%)	890 (1.2%)	198.7 (1.2%)

3.7.4 Irish participants' roles in the FP6 projects

Irish participants took on the role of coordinator in 25% of the projects in which they were involved and occupied the role of coordinator in 20% of their participations, well above the FP6 average of 14%. This is a very good level of performance, albeit one that is boosted by strong performance in the Marie Curie (mobility) actions where there is a high ratio of coordinators to participants. Irish HEIs were mainly responsible for boosting Irish coordinator rates, taking on this role in 28% of their participations. Other groups were coordinators for between 10% and 14% of their participations.

Irish coordination rates were higher than the FP6 averages in the Nanotechnologies and nanosciences, Food quality and safety, Sustainable development, and Human Resources and mobility areas. Irish coordination to participation rates were higher than the FP6 averages in several other areas too, but the numbers of projects and coordinator roles was relatively

[4] Arrows (⇑⇒⇓) have been used to symbolise Ireland's performance for each Instrument compared to its overall performance in FP6 of 7.1%. e.g. 8% in STREPS is 'close to average' (⇒) while 21% of the NoEs is 'above average '(⇑)

small so the ratios are not a very reliable indicator of performance in those other areas. In terms of the different FP6 instruments, Irish coordination rates were highest (in relative terms) for the Marie Curie Actions, STREPs, Specific Support Actions and Integrated Projects. Coordination rates were lowest for the CRAFT (Co-operative research projects) and Infrastructure-related Instruments (I1 (Specific Actions to Promote Research Infrastructures) and I3 (Integrated Infrastructure Initiatives)).

The majority of Irish participants in FP6 projects have indicated through our survey that they occupied either a primary role or a major role with regard to most elements of the FP6 projects in which they were involved. Irish participants' roles were greatest in relation to (i) carrying out the research, (ii) disseminating the results, and (iii) defining the content and scope of the project. Irish participants have also in most cases played a full role in planning or coordinating future research. In comparison Irish participants in most cases played only a minor role in defining the size and membership of the consortium, negotiating the IPR (Intellectual Property Rights) arrangements, and research training.

3.8 The drivers and motives for FP6 participation

3.8.1 Motives and drivers

The primary motives for Framework participation as revealed by our survey of participants are to develop new or improved relationships or networks, to develop and extend internal knowledge and capabilities, and to access research funding. Other motives rated as important or very important for most respondents are (i) to develop new or improved tools, methods or techniques, (ii) to solve specific scientific or technical questions, (iii) to tackle problems that have a European or international dimension, and (iv) to access capabilities that do not exist in Ireland.

There is a good degree of alignment as to the most important motives across the four main participant groups, with all considering the development of new networks and relationships and the extension of knowledge and capabilities as a 'top 3' motive for participation. Accessing research funding was the primary motive for the HEIs, and was a 'top 5' motive for research institutes and industry, but was ranked as less important by 'Other' participants. We also identified that industry rated the development of new or improved commercial products and services as a primary motive, but this appears well down the list of important motives for other groups.

3.8.2 The impact of national funding in leveraging FP involvement

FP6 coincided with a period of rapid expansion in the levels of national research funding in Ireland, and our survey of FP6 participants revealed that in almost all cases the national funding situation has either had no impact or a positive impact on these participants' desire and ability to become involved in Framework. In most cases respondents indicated that national funds have significantly enhanced their capacity to perform research, and some mentioned that the infrastructure and equipment provided through national funding, as well as the increased numbers of researchers, has enhanced their ability to become involved in European projects.

It should be remembered, however, that our survey was focused on FP6 participants and will therefore have omitted the views of researchers who have chosen not to participate in FP6 as a result of increased national funding. It should also be remembered that there has been a

continuing downward trend in the number of Irish participants from FP4 to FP5 to FP6. The impact of the new money has therefore not heralded any significant increase in FP participation, but it has also not led to any significant decrease.

Interviews with some of Ireland's key researchers have confirmed that national funding has in some cases led to a decreased desire to apply to the Framework Programmes, but the extent to which this has happened cannot easily be determined. Some interviewees indicated that national funding has been easier to access than FP funding in recent years, and that it has taken time to establish national research groups and projects, leaving less time to pursue FP involvement. For some researchers this has meant no FP participation while for others it has meant a more reactive approach, with less likelihood of leading projects but a willingness to still become involved. Therefore national funding increases over recent years appear to have exerted both positive and negative effects on demand for FP participation among Irish researchers.

While the 'net' influence of national funding on FP6 participation is difficult to discern at the present time, there is a reasonably broad consensus that national funding will in the future enable higher levels of FP involvement, due to the enhanced research capabilities and capacity that it has brought to Ireland. With the right signals, incentives and strategies it is expected that national funding and FP funding will become more closely linked, with the former building the capacity and capabilities that can be used to leverage funding and other benefits from the latter.

3.9 Collaboration patterns within Ireland's FP6 projects

Irish participants in FP6 have 'officially' collaborated with over 6,700 non-Irish partners within the scope of the projects, though we believe that the true figure is closer to 5,000 due to problems with the coding of organisation names in the FP6 database. The average number of partners in which Irish organisations was involved was 16, which is broadly in line with other comparable countries.

3.9.1 Intra-Ireland collaboration

Irish participants collaborated with other Irish organisations within 18% of their projects. Ireland-Ireland links constituted 2.1% of Ireland's total links to EU-25 countries within FP6 projects, placing it 18th out of the EU-25 in terms of its proportion of 'intra-country' links. The data suggests that the larger countries perform best on this measure, with Germany, France, the UK, Italy and Spain heading the list, but even so there is clearly room for improvement in terms of Ireland's intra-country collaborations within FP projects.

The level of intra-Ireland collaboration was highest in absolute terms in the Information society technologies area, which accounted for ~20% of all intra-Ireland links. In proportionate terms the areas with the highest level of intra-Ireland collaborations within projects were Food quality and safety (38% of projects), Nanotechnologies and nanosciences (31%) and Horizontal research activities – SMEs (27%).

It might have been anticipated that the highest level of intra-Ireland collaboration would take place within the IPs and NoEs, due to the larger numbers of partners involved in those Instruments. This is to some extent the case, with around a quarter of the IPs and NoEs (with Irish involvement) involving intra-Ireland collaborations. However, it was within the SME-focused Collective Research Projects that intra-Ireland collaboration was highest, with almost half of the projects with Irish participation involving at least two Irish partners. The Co-

operative Research Projects and Coordination Actions were also associated with relatively high levels of intra-Ireland collaboration (24% and 21% respectively).

Our analyses have shown that while HEIs account for 53% of Ireland's participations, they only account for 38% of the participations in projects with intra-Ireland collaboration. We have also found that HEIs' intra-country collaborations are just as likely to be with other HEIs as with other types of organisation. Industry is the group that has performed best in terms of Ireland's intra-country collaborations, accounting for 31% of the participations in projects with intra-Ireland collaboration but only 19% of Ireland's FP6 participations overall. Research institutes and Others' share of participations in projects with intra-Ireland collaboration is in rough proportion to their overall share of FP6 participations.

3.9.2 North-South collaboration

Irish participants had 60 participation-level collaborations with partners from Northern Ireland across a total of 53 FP6 projects. This 'North-South' collaboration has mainly been with Queen's University Belfast and the University of Ulster, though there have also been collaborations with companies from Northern Ireland (x8 participations), research institutes (x3) and public agencies (x2). It is not easy to determine whether this level of collaboration is higher or lower than might be expected or deemed desirable, but it does stand as a benchmark against which future levels of North-South collaboration can be judged.

3.9.3 Collaboration with actors from different countries

Ireland has collaborated with partners from 84 different countries within FP6. In volume terms the greatest number of collaborations took place with partners in the UK and Germany (~13% of collaborations), followed by France (~10%) and Italy (~9%). However, this reflects mainly the high levels of participation in FP6 by these countries as a whole. Looking at the ratio of each country's share of participations in Irish projects to their overall share of FP6 participations revealed that Ireland's most active 'Member State' collaboration partners during FP6 were Luxembourg, Portugal and Finland and the least active were the Czech republic, France and Germany.

3.9.4 Collaboration with the stable core of European S&T organisations

Our analyses have shown that Irish organisations have had significant levels of collaboration in FP6 with the ten identified (non-Irish) organisations that were the most active 'network' partners in FP5. It is considered important that Irish organisations have strong links to the stable 'core' of major FP participants, and the results from this study indicate that they do.

3.10 Outputs delivered through FP6 projects

Our survey of FP6 participants has revealed that (i) scientific conferences, seminars and workshops, (ii) publications in refereed journals, (iii) new or improved tools, methods and techniques, and (iv) other (non-refereed) publications were the most widely produced types of output from FP6, with 70% or more of the projects producing at least one such output. Publications were the most numerous type of output produced, with each project producing on average a dozen publications. Conferences, seminars and workshops were the next most prevalent form of output, with project teams running on average five such events. Around two-thirds of the projects have resulted in newly trained or qualified personnel, with an average of just over two trainees per project. There was also a significant exchange of personnel within almost half of the projects, and a similar proportion of projects have led directly to follow-on research grants being awarded to members of the project teams.

The outputs produced most regularly and widely by FP6 projects were also rated by participants as the most important types of output, which suggests that in most cases the projects are successfully producing the kinds of outputs that the participants expect and need. Some significant differences between the four main groups were identified, with, for example, the HEIs and research institutes rating publications and trained personnel more highly than did industrial and 'other' (mainly public sector) participants. The latter two groups rated new or improved tools, methods and techniques and new or improved commercial products and services as most important, and while these were also rated fairly highly by the research institutes they figure as less significant overall for the HEIs. It seems that while there are some important differences in the priority given to different types of output by the different groups, there is a sufficient degree of alignment between them to ensure that all participants are able to realise the kinds of outputs they are seeking.

The study has found that all types of participants – including industry - place some of the more 'commercially' oriented outputs, i.e. those relating to invention disclosures, license agreements, patent applications and patents granted towards the bottom of their 'importance' list. New or improved tools, methods and techniques, and to a lesser extent new or improved commercial products and services are rated much more highly and widely in terms of their importance, and tend to be delivered through a larger number of FP6 projects. We believe that this is because inventions, licences and patents tend to involve IPR arrangements that are difficult to assign within the context of collaborative (pre-competitive) research projects.

3.11 Benefits realised through FP6 projects

3.11.1 The main benefits of FP participation

The main positive benefits realised by FP6 participants come in the form of (i) improved relationships and networks, (ii) increased understanding and knowledge, (iii) enhanced reputation and image and (iv) increased scientific capabilities. The FP6 projects also bestow significant benefits in related areas such as increased technological capabilities, improved planning of research, improved ability / capacity to carry out research / training, and improved competitive position nationally and internationally. There is accordingly a good degree of alignment between participants' motives for FP6 participation and the kinds of benefits they are realising, with new and improved networks and new knowledge and capabilities figuring as the key motives for participation and also as the areas of greatest and most widespread impact. This suggests strongly that FP participants are becoming involved in order to realise the kinds of benefits that the FP projects are able to deliver, ensuring reasonably high levels of success as judged by the participants themselves. Relatively few differences were noted between the four main participant groups concerning the kinds of benefits they realise through FP participation.

Our discussions with interviewees explored in more depth the different types of benefits that FP participation brings to the national research endeavour. The feedback received supported the picture from the survey, where exposure to other researchers from different countries brings significant benefits in terms of the exchange of knowledge and capabilities and in prompting or otherwise opening up new research directions or new approaches. The FPs are considered to bring very significant benefits to national researchers in terms of enhancing their scientific and technological capabilities through exchanges with researchers from

abroad, and the collaborative projects also play a significant role in exchanging knowledge between academic and industrial participants, with researchers gaining a greater depth of insight into industrial problems and industry gaining improved understanding of the opportunities provided by new research developments. These 'symbiotic' processes are at the centre of the 'added value' that the European collaborations can bring, and for most participants bring benefits that significantly outweigh the additional costs that are inevitably associated with multi-partner, multi-country collaborative projects.

Individual interviewees have provided fairly compelling accounts of the considerable benefits they have enjoyed in term of their international reputation and image, their capacity and capabilities to carry out research, and their networks and connections to other players within the industrial and academic communities. There is a sense of a growing maturity within the research community as to how to extract value from the Framework Programmes, and an increased likelihood that participants are becoming involved for the right reasons, looking for and valuing the kinds of benefits that tend to flow. The benefits, particularly in terms of research profile, networks and reputation and image appear to be strongest when Irish partners coordinate projects.

3.11.2 The role of FP6 in supporting and reinforcing participants' research strategies

The vast majority of FP6 participants reported that FP6 had exerted a positive impact on their research strategies, with around half stating that it had supported and reinforced it to a large extent and almost half stating that FP6 had supported and reinforced their R&D strategy to a small extent. Only 5% of respondents indicated that FP6 had not had any role in supporting or reinforcing their R&D strategies.

Feedback from interviewees has confirmed that those involved do indeed in most cases see a strong natural alignment between their own research priorities and the opportunities available within the FPs. The impact of FP participation on participants' individual research strategies is generally seen to be a strongly positive one, with the collaborations bringing new ideas, new capabilities and new infrastructure to bear on existing research areas, questions and problems. The FPs have impacted on national strategies by influencing the direction of participants' work, increasing the range of methods and tools available and opening up new lines of enquiry.

While there is a good alignment in most areas, it is clear that the relationship between national and EU-level priorities has become more complex and varies significantly across the different research and industrial fields. During the early FPs (1-4) national research strategies were much more strongly influenced by the FPs, as EU funding vastly outweighed the volume of funds available at national level. However, the advent of significant levels of national funding has brought with it a new sense of national priorities as distinct from EU ones, and the relationship between the two are at present much less clear. There is certainly the possibility that national funding will, at least in the short term, have created a divergence between national priorities and those of the FPs within some parts of the community, and it is necessary for funding agencies and research performers to investigate further the extent to which this is happening, particularly in the IST and Life sciences areas, where SFI funding has altered significantly the pattern of funding and the status of national research agendas.

3.11.3 The role of FP6 in supporting the internationalisation of research

Our interviews with key participants confirmed that the Framework Programmes continue to be the most important instrument for supporting the internationalisation of research. While

some other international programmes such as COST (European Cooperation in Science and Technology) and EUREKA[5] also help to facilitate network development and mobility of researchers, each instrument occupies its own space and there is limited direct overlap between them. There is no other international collaborative funding scheme with the same scale as the FPs and which provides such significant amounts of funding from a centralised pot. As such, FP remains the most important instrument for international collaborative research and networking.

The FPs were not generally considered to be playing a major role in extending collaborative networks outside of the EU, though this does happen to some degree. However, the FPs have been effective in acting as a stepping-stone for other, related European initiatives such as the Competitiveness and Innovation Programme (CIP). Experience and profile gained through the Framework Programmes helps to further the opportunities available within other EU-level support mechanisms. In addition, good levels of FP participation and inclusion in the key networks is considered to be crucial for involvement in the European Technology Platforms, Joint Technology Initiatives and Joint Programming Initiatives that are developing roadmaps for future EU research. Such planning initiatives are seen as both reflective of and conducive to FP involvement more generally, as they bring together the recognised major players in planning the programmes of research to be implemented through subsequent FPs. Overall there is a sense that involvement in FP research projects and involvement in other EU initiatives are becoming increasingly linked, with the two acting in a mutually reinforcing way.

3.12 Wider impacts of FP6 projects

3.12.1 Exploitation of FP6 project results

Our survey of Irish participants revealed that researchers have been the primary 'exploiters' of FP6 project results, using the information and experience gained in follow-on research. European and Irish researchers are considered to have exploited the results to a significant extent and in broadly equal measure, while researchers from outside the EU have also exploited the results of a significant number of projects but in most cases to a small extent. Almost half of the projects have been exploited by EU-level policymakers and European companies, but mainly to a small extent. Irish companies and Irish policymakers have exploited the results of FP6 projects in around a third of cases, though in most of these instances the level of exploitation is felt to be small, with only a small minority of projects with Irish participation being exploited 'to a large extent' by either group. This suggests that the main impacts of FP6 projects will be on the research community, with the benefits to Irish policy formulation and the business sector being lower in relative terms.

3.12.2 Contribution of FP6 projects to the achievement of EU objectives

Our survey of participants has shown that the main areas of impact (i.e. those where the majority of projects are claimed to have made a medium-high contribution) are on EU research networks, research capabilities, research planning, the mobility and career development of EU researchers, and international network formation beyond the EU. These are obviously areas of more immediate or 'near-term' impact from research projects.

5 EUREKA - A Europe-wide Network for Market-Oriented Industrial R&D . www.eurekanetwork.org..

It was a specific focus of FP6 to seek to restructure and integrate EU research in order to further the creation of a single European research area and to help build critical mass as a means by which to strengthen EU S&T capabilities and to advance EU competitiveness. Our findings show that most FP6 projects have made some kind of contribution to these objectives, but in the majority of cases projects have made only a small or medium contribution rather than a large one.

There is a perception that the FPs support a 'core' of recognised research groups and industrial players at EU level and that there is an increased focusing of resources within these core networks. It is not clear whether such a view is accurate, but there is good evidence to suggest that there is a stable core of actors who do indeed account for the majority of FP participations and funding, and a long 'tail' of other participants who are involved only once or on an occasional basis. There is a perception that the objective of 'integration' implies a greater focus of funding on this 'core' and a reduction of support for actors on the periphery, something that again would appear to be supported by data which shows Ireland had fewer participants but a significantly increased funding allocation in FP6 as compared to either FP5 or FP4. It remains unclear as to whether such a trend is an explicit objective and whether it will continue or not, but this appears likely.

The contribution of FP6 projects to wider EU goals (i.e. those relating less to 'research' and more to socio-economic-related goals) is understandably more limited, but here we still find that a majority of projects are claimed to have made some kind of contribution, albeit a small one, to areas such as industrial competitiveness, quality of life, social cohesion and environmental protection.

3.13 Costs and benefits of participation in FP6 projects

Most of Ireland's FP6 participants (80%) realised a positive benefit to cost ratio from their projects. The remainder were fairly evenly split between those that had realised a 'neutral' result, and those who indicated that the costs of participation had outweighed the benefits. This is a reasonably positive result overall, but one that falls slightly below the level achieved in FP5. However, when asked to make a direct comparison with FP5, most of the FP6 participants who expressed an opinion stated that FP6 benefit:cost ratios were better than in FP5. Overall these results suggest that FP6 is neither significantly better nor significantly worse than FP5 in terms of the benefit:cost ratios realised by Irish participants.

HEIs and research institutes enjoy the most positive benefit to cost ratios, with industry and 'other' participants more likely to report neutral or negative benefit to cost ratios. Respondents reporting a negative benefit to cost ratio tended to indicate that there were problems with the high management and administrative burden associated with participating in FP6, problems with audit requirements and in some cases delays in receiving the EC funding. Other problems related to the selection of (inappropriate) partners and poor coordination of the work, which had led to the failure to achieve scientific objectives, and which in turn had limited the extent to which the participants could successfully exploit project results in either a policy or industrial setting.

Few strong differences in benefit to cost ratios were identified across the different FP6 instruments, though the Marie Curie actions (mobility) appear to be 'best' at delivering positive benefit to cost ratios for participants.

Irish participants that occupied a more central role in their projects enjoyed, on the whole, more positive outcomes than those that were involved only as partners. All of the

respondents reporting that the costs of participation outweighed the benefits (i.e. a negative outcome) were partners rather than coordinators. Overall Irish coordinators tended to report that the costs of managing projects were relatively high but the benefits of having a 'central' role within the European networks meant that in most cases the benefits significantly outweighed the costs. Partners in the projects tend to incur lower costs but also find it more difficult to manage value from the research, with some finding that the results and the experience overall were not particularly in tune with their own organisation's needs.

3.14 Satisfaction with FP6 administrative processes

Irish participants in FP6 projects were in most cases either satisfied or 'neutral' with regard to the various FP6 administrative processes, with only a minority of respondents either 'very' satisfied or in some way dissatisfied. Satisfaction ratings were highest in relation to (i) the management arrangements within the projects, (ii) information provided to prospective applicants about how to apply, and (iii) processes for dissemination and exploitation of project results. Procedures for proposal evaluation and selection also obtained reasonably high ratings overall, though it should be noted that several comments were received concerning low levels of expertise within the FP6 evaluation panels. Satisfaction with processes was lowest, relatively speaking, in relation to (i) contract negotiation procedures, (ii) reporting procedures, and (iii) mechanisms for payment of the Commission's contribution to the project cost. These elements are often difficult for participants to manage or can add significant delays to the projects, and so it is not surprising to find that a greater proportion of participants have had problems with these aspects.

There was a general consensus that FP6's rules were better than those employed in FP5 but the levels of administrative complexity were worse (i.e. higher). For some reason the research institutes appear to have suffered particularly with the changes from FP5 to FP6, being twice as likely as other types of participant to state that the rules / administrative complexity have become worse. The new instruments introduced for FP6 - Integrated Projects and Networks of Excellence – also appear to have caused particular problems in terms of the administrative burdens involved.

Unsuccessful applicants were also asked about their experience of the FP6 application 'process' and, perhaps surprisingly, we again found reasonably high levels of satisfaction. Overall it seems that for most applicants, even the unsuccessful ones, the information provided and the procedures employed attract reasonably positive ratings. There were, however, two areas where the balance of opinion was negative and these concerned the transparency of the evaluation and selection procedures employed and the quality of the feedback provided following a decision not to support the proposal. These relate closely to the decision not to support the proposal, so the higher levels of dissatisfaction in relation to these aspects are perhaps to be expected. However, we found a more general and widespread dissatisfaction with the FP proposal evaluation system, with even FP 'advocates' that have been very successful in obtaining funding stating that the quality of the evaluators is questionable and the outcomes 'erratic'. Certainly the more experienced players tend to put in a range of proposals because it is hard to predict which ones will attract the eye of the evaluators. Quality alone is not considered to be sufficient to guarantee a successful outcome, and behind the scenes 'positioning' is often considered to be as important as the inherent strength of the project idea, at least within some parts of the programme.

3.15 Use of FP6 support

3.15.1 Extent to which participants have sought assistance

Less than half of the FP6 participants indicated that they had consulted specific individuals, service providers or information sources to obtain information or assistance in relation to FP6 prior to applying. HEIs and research institutes were roughly twice as likely to have consulted support providers than either industry or 'other' types of organisation. Those who had sought assistance identified the main sources of advice as University support offices, Enterprise Ireland and / or other national agencies, National Contact Points (NCPs), and the European Commission, though a range of other providers were also mentioned.

Unsuccessful FP6 applicants were slightly more likely to have consulted specific individuals, service providers or information sources prior to applying to FP6, with just over half indicating that they had sought such advice. Broadly the same list of 'providers' was given, though unsuccessful FP6 applicants used university support offices to a lesser extent and Enterprise Ireland to a greater extent.

3.15.2 Satisfaction with FP6 support

The vast majority of FP6 participants who had sought assistance in relation to FP6 were satisfied or very satisfied with the support they received, with only 6% of users indicating that they were in any way dissatisfied with the services. A broadly similar (and positive) perspective on the support received was obtained from the unsuccessful applicants. These findings indicate no particular problems with the information and support available during FP6, though of course it does not tell us anything about what could have been achieved had more support been provided to a broader range of prospective participants.

3.15.3 Extent to which actors have helped other participants to get involved in FP6

Our survey of FP6 participants indicated that around a third of the respondents had, in some way, facilitated other actors' involvement in FP6 projects, with all four main groups of participant equally likely to say that they had done this. The survey also revealed that around one in five of the participants stated that they had been encouraged by other organisations to become involved in their FP6 projects. Industry participants were most likely to have been encouraged by others to become involved, while research institutes were least likely.

These findings signify that many Irish participants are actively encouraging other Irish organisations to become involved in specific FP projects. Unfortunately there is no baseline data against which to test this level of 'support', but the results from the study as a whole indicate a growing awareness of the benefits of Framework participation nationally and increased efforts on the part of some actors to proactively increase the extent to which they help other Irish actors to become involved. These results also provide good evidence that this approach is working, with Irish involvement in specific FP6 projects, particularly by industry, having been boosted by other Irish actors. However, we believe there is scope for further and more conscious efforts in these directions in order to further increase the number of Ireland-Ireland collaborations within FP projects, which in FP6 were below the level of 'intra-country' links found in many other comparable EU countries.

3.16 Preliminary findings with regard to FP7

3.16.1 Early participation rates

Our survey of FP6 participants revealed that just over half of the FP6 participants have applied to FP7 (to date) and in almost half of these cases they have already participated in one or more FP7 projects. These are reasonably positive results, particularly the success rates among those who have applied.

Somewhat inevitably, most unsuccessful applicants reported that the experience of FP6 rejection had impacted negatively on their desire to participate in FP7, but even so, almost half have already applied to FP7 – a very positive result. There were markedly different application rates among those who had been unsuccessful with only some of their FP6 proposals and those who had been unsuccessful with all of their FP6 proposals, confirming that success (or otherwise) in one FP does significantly affect application levels to subsequent programmes. However, the results were much more positive when we looked at unsuccessful FP6 applicants' success rates in FP7. Here we found that just over half of the unsuccessful FP6 applicants who applied to FP7 have been successful. Even more encouragingly, the FP7 success rates appear higher for those who were unsuccessful with all of their FP6 proposals as compared to those who only failed with some of their FP6 bids. This finding suggests that unsuccessful FP applicants should not necessarily be discouraged from applying to subsequent FPs, as there is clear evidence that fortunes can be turned around relatively quickly.

Despite these positive indications, most unsuccessful FP6 applicants are more likely to decrease the number of proposals they submit to FP7 in comparison with FP6 than to increase the number. The same holds for the number of projects that unsuccessful FP6 applicants expect to participate in within FP7. Most of the reasons given for a forecasted decrease in FP7 participation related to the fact that the administrative burdens and complexity are too high, the outcomes too uncertain and the success rates too low for them to bother. A small number expect to increase their application and participation rates, however, and pointed to their increased understanding of what is required and their increased capabilities to meet those requirements. Some respondents also indicated that they have found FP7 to be a better fit with their priorities or competencies.

We also discovered that many unsuccessful applicants have taken some kind of positive steps to improve their chances of success in FP7. These steps include a general strengthening of their approach to developing ideas, forming consortia and preparing proposals, with most respondents seeing a need to become more targeted and focused and to put the necessary time and effort into building very strong proposals. This increased 'focus' on ensuring that every aspect of the idea, team and the proposal itself is as strong as it can be has come through significantly in the comments, and is a rather positive finding as it signals that many applicants believe that the outcome is in their own hands. While a small number of respondents clearly still believe that the process is something of a lottery, most are now attuned to the idea that there is a recipe for success that can be followed and while it won't guarantee a positive result every time, such an approach across several proposals means that success with one or more of them is highly likely.

3.16.2 The relevance of FP7 to Irish researchers

When asked to give their views on whether certain aspects of FP7 are better or worse than those of FP6 the most 'popular' view expressed by FP6 participants is that FP7 is much the same as FP6 in terms of the relevance of the priority topics, the relevance of the instruments,

the level of administrative complexity and the rules of participation. Where respondents have considered that FP7 is either better or worse, the balance of opinion is that FP7 is an improvement on FP6 across all of the given aspects. Reassuringly, unsuccessful FP6 applicants mirror this generally positive view as regards FP7.

This picture was confirmed through our interviews with key participants, most of which felt that FP7 was an improvement on FP6, with similarly clear priorities but improved (simpler) instruments. The introduction of the IPs and NoEs at the start of FP6 had led to the creation of very large consortia and this was felt to have impacted negatively on the already low levels of industry participation in Framework. Under FP7 there is a sense that consortia will be smaller and this will be advantageous to smaller countries with smaller players. It was also felt that FP7 constituted an 'evolutionary' change over FP6, and did not contain as many radical changes as those from FP4 to FP5 or from FP5 to FP6. As such, it will be easier for actors to build on their involvement in FP6, particularly given the significantly enhanced level of support available at national level.

Another positive feature of FP7 is that it will operate for a longer period than previous Framework Programmes, and as such it is felt that its instruments and their associated administrative rules will be more stable. This is considered important as applicants will have more time to understand and meet the requirements and this should help more peripheral actors (and countries) to gain a stronger foothold. It is also hoped that this will help to encourage higher levels of involvement by industry, as their ability to cope with high levels of administrative complexity and changing requirements is far below that of the major public research performers. This is particularly important for Ireland as most of its industry participants, at least to date, have been indigenous SMEs.

3.17 The new National Support Network for FP7

The new National Support Network (NSN) introduced in Ireland for FP7 is intended to provide a more comprehensive and more coordinated package of support measures to FP7 applicants and participants than has been the case in previous FPs.

Between a third and a half of the FP6 participants and unsuccessful FP6 applicants have sought advice or support from service providers, similar proportions that sought help in relation to FP6. However, FP7 is still in train so it would be reasonable to expect that the overall level of take-up of assistance will increase in the fullness of time and will surpass the levels seen in FP6. HEIs and research institutes showed higher levels of take-up of support than industry and 'others' but take-up by these latter two groups appears to be slightly higher than was the case in FP6. This is an encouraging result.

In most cases the assistance required relates to either (i) information on specific calls, with participants seeking help with identifying which calls are relevant, understanding in more detail what the requirements and rules associated with the calls are, how the application process works, deadlines, and so on, (ii) assistance with the preparation of proposals, with participants looking mainly for advice and guidance on what information should be provided, what aspects or elements to focus on, strategies for success, and so on, or (iii) other more specific forms of assistance, including financial support towards the costs of proposal development, help with finding partners, or legal advice.

The feedback received indicates that the participants have been making greater use of the available support than was the case in FP6, with usage levels for each of the main service providers (NCPs (National Contact Points), UROs (University Research Offices), NDs (National

Delegates), EI (Enterprise Ireland) and the EC (European Commission)) being much higher than in FP6, and signalling that participants are increasingly seeking support from a range of different providers.

Satisfaction levels with the support providers is very high, though there is some evidence that participants are becoming more demanding, possibly due to an awareness that the new support system has been significantly enhanced. As such, we have found higher proportions of respondents expressing dissatisfaction with the support, and higher proportions providing a neutral rating than was the case for FP6. Overall, however, the feedback received continues to be overwhelmingly positive, with ratios of satisfied to dissatisfied customers averaging somewhere between 5:1 and 10:1 for the main providers.

Discussions with senior researchers confirmed that there is a high level of awareness of the new FP7 National Support Network and that it is perceived to be a far stronger system than was in place for previous FPs. The support system is seen to be more comprehensive in terms of the assistance on offer, and is more centralised, coherent and coordinated. It is also felt that the new NSN has been effective in promoting itself to relevant actors and that the services available are well known to prospective participants. The existence of a strong support system is seen to be of particular importance for the less experienced applicants who need help with finding partners, proposal development, and in understanding and complying with the various administrative rules and procedures that are in place.

While the overall feedback on the new National Support Network has been extremely positive, we received a range of suggestions as to how the system could be further enhanced. These included widening the range and flexibility of supports available; strengthening the role of the National Delegates and experienced researchers in the support network; focusing the support on actors who most need the assistance, particularly new and inexperienced applicants; and, perhaps most importantly, evaluating the effectiveness of support provision in increasing demand for participation and success within the competition.

3.18 Irish Framework participation in the EU policy context

The terms of reference for this study focused on Irish participation in the mainstream instruments of the Framework Programme (FP) to determine the effectiveness and impact of FP6 in achieving its objectives of research integration, ERA (European Research Area) structuring and ERA strengthening for Ireland and to investigate the added value and relevance of FP6 to research and development in Ireland, the support structures in place, the leverage from higher education institutions in assisting and encouraging industry participation in FP6. However, the FP in general –and FP6 in particular – has policy intentions that go well beyond the benefit to effort ratio of individual project involvement, but aims to 'structure' Europe's R&D activities, create more open internal R&D markets and 'optimise' the performance of the European research and innovation system as a whole in global competition. It does not follow that EU-level optimisation and increased internal competition is in the short-term interests of individual member states. Rather, states need to adjust their policies to compete for and establish competitive advantages within an EU division of labour that continues to evolve.

3.18.1 The EU policy context

The FPs date from the mid-1980's (FP1 ran 1984-7), though they have roots in earlier activities (e.g. MAP-Multi-Annual Programme). Over time the scope of the FP has tended to widen, so that it now covers a very wide range of themes, and the repertoire of instruments

has increased from the early focus on collaborative research. The FP has also seen continuous growth and currently funds about 5% of state R&D and 1% of BERD (Business Expenditure on R&D) in the EU[6].

Up to and including FP4, European Added Value (EAV) in the form of networking, cohesion, scale benefits, etc. was largely seen as sufficient justification for the FPs. In FP5, the focus shifted towards socio-economic benefits. FP6 then marked a radical change in direction for the policy meaning of the Framework, with the agenda shifted from creating EAV by networking the European 'knowledge collective' to restructuring the ERA. FP6 was designed at the time when the Commission launched the ERA [7] policy, aiming to concentrate research resources and create a European RTD (Research & Technological Development) system whose most excellent parts could compete globally. This led to increased concern with research (which should be excellent and in which Europe should build scale), rather than the earlier industry policy and impact focus.

FP6 therefore included new, larger instruments. The previous industrial strand continued, but was less of a focus and involved less effort. FP6 also marked the creation of Technology Platforms and ERA-NETs, which encouraged the self-organisation of cross-border groups that would drive R&D and innovation policies for their sectors or technologies. These generally collect together existing strong interests and the thrust of the Technology Platforms is continued in FP7's JTIs (Joint Technology Initiatives) and through increased interest in Article 169 arrangements.

A theme of the FPs has been their role in 'industry policy', using RTD funding to try to reach competitiveness goals. Certainly, the early FPs were (to a degree) the 'industry policy' of the Commission. However, a growing amount of scientific and technological research has been added over time. The increased focus of FP6 (and FP7, with the creation of the European Research Council (ERC)) on research represents continuity with a trend of focusing increasingly on 'knowledge infrastructure' and less on industry.

The links between some of the individual actions and the overall objectives of the FP remain less well articulated than is desirable, but the connection between the new instruments and the objectives of ERA is a lot easier to see.

At the time FP6 was defined, the Treaty of Rome[8] stated, "The Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level". It empowers the Community to support both industry and knowledge infrastructure to this end (Article 163). The Commission is empowered by the Treaty to define and operate the FP (Article 164) and "The Community and the Member States shall coordinate their research and technological development activities so as to ensure that national policies and the Community policy are mutually consistent" (Article 165). Articles 169 & 171 enable the Community to support "research and development programmes undertaken by several Member States" and to "set up joint undertakings" that exploit 'variable geometry' and therefore allow the Commission to promote the restructuring of the ERA without achieving unanimity in all matters.

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[6] Commission Working Staff Document, *Impact Assessment*, Accompanying Document to Towards Joint Programming in Research (COM(2008) 468 final), SEC (2008) 2282, Brussels: European Commission

[7] *Towards a European Research Area*, COM(2000) 6 final, Brussels 19.1.2000

[8] Official Journal of the European Communities, Consolidated Version of the Treaty Establishing the European Community, C325, 24.12.2002

There is specific enabling legislation for FP6[9]. This explains that the programme will strive towards greater integration of research in Europe by means of:

- Focused action in priority thematic research areas using powerful instruments (integrated projects, networks of excellence) to bring appropriate configurations of research actors together for the new challenges in these areas, with critical mass;
- Systematic and coordinated planning and execution of research to support Community policies, and to explore new and emerging scientific and technological areas, taking account of needs expressed by the relevant actors throughout the EU;
- Promoting the networking and joint action of national and European frameworks for research and innovation, and the opening up of national programmes, in these priority areas, including use of Article 169 actions where appropriate, plus other areas where this would be of benefit to the performance of Europe's research base.

The legislation also stresses the need to involve 'third countries' in the FP, both in the thematic priorities and in "specific international cooperation activities with some groups of countries, as a support to Community external relations and development aid policies." Participation by SMEs and candidate countries is also to be encouraged.

3.18.2 How did FP6 do overall?

A high-level expert group recently evaluated[10] FP6 as a whole, supported by half a dozen experts and 30+ specially commissioned evaluations of different aspects of the FP. The group found that FP6's achievements were very high in terms of continuing the FPs' tradition of funding high quality, useful research, but was alarmed at the continuance of the long-term pattern of declining industrial participation in the FP.

The ERA-NETs and European Technology Platforms were important in helping articulate joint needs and research opportunities bottom-up, while the emergence of the European Research Council (ERC) played an equivalent role in relation to researcher-initiated research. Overall, however, the progress towards implementing the ERA had been limited. The new instruments of FP6 had not had a structuring effect on the R&D community, and a lot more effort was needed to use the 5% of EU state-funded research spent through the FP in a way that would create a European strategy and that would 'leverage' the national spending to promote the ERA.

A key concern was the opaqueness of the FP design process. No one could explain how this was done, except to say that a lot of consultation and lobbying was involved. The group argued that making this process clear was a precondition for devising a transparent and agreed strategy. Without this it is difficult for member states to contribute adequately to FP design or to align their own strategies with the FP (e.g. through thematic specialisation). Such alignment would depend upon building on national strengths and establishing comparative advantages in ways that complement the FP and the evolving RTD structures of the ERA. It should not involve the slavish copying of FP thematic priorities, which some new member states have engaged in.

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[9] Council decision of 30 Sep 2002, adopting a specific programme for research, technological development and demonstration: 'Integrating and strengthening the ERA (2002-6), (2002/834/EC), OJ 29.10.2002

[10] Ernst TH Rietschel (chair), *Evaluation of the Sixth Framework Programmes for Research and Technological Development 2002-6*, Report of the Expert Group, Brussels, European Commission, 2009

The group's key conclusions related to the need to continue to work both top-down and bottom-up to improve the evolutionary fitness of the European RTD ecology, to develop a clear, rational and complementary fit between member state and EU RTD policies. Europe needed to take a more confident and active position in global RTD cooperation and to engage with the world, not just with itself.

The FP was launched after a period when European R&D cooperation had blossomed on a multilateral basis (e.g. CERN, EMBL, COST and ESF)[11] and has since become increasingly involved in funding aspects of these cooperations. Because the FP exists and is a simpler way to channel money than creating new multilateral organisations, there have been no significant new European R&D cooperations established where the Commission is not central. The ERC story serves as a useful symbol - originally proposed as something that should belong to the scientific community and that could be based anywhere in Europe provided the Commission was not involved, it ended up as a budget line in FP7. There is one historical exception to the Commission's monopoly of European action, namely Eureka, which was in effect Paris' reply to what it saw as a shift of power towards Brussels. But that was in 1985 and even Eureka has now succumbed to the funding logic and taken Commission money for the EUROSTARS programme. The FP6 evaluation argued that this concentration of power, and the risk of monopoly of thought that accompanies it, is problematic.

3.18.3 Changes in Framework Programme instruments

The sequence of new instruments introduced during and after FP6 shows a clear tendency towards larger interventions, promoting self-organisation by established interest groups, delegating administration from the Commission to the research performers, influencing member state research and innovation budgets and imposing forms of governance that involve actors at the level of member states but that often bypass the agents of the states themselves so that the member states are involved but disempowered. We can think of these instruments as belonging to four generations.

Generation 1. Integrated Projects and Networks of Excellence were introduced in FP6 to generate disequilibrium or 'creative destruction' in the fabric of the R&D infrastructure. However, their failure to do this is clear and these instruments have been discontinued in FP7. It might have been natural to replace them with something like 'competence centres' that would geographically focus R&D resources, but this step has not been taken and the FP now lacks internal instruments for restructuring.

Generation 2. The ERANET and ERANET+ schemes are becoming precursors of a form of Joint Programming that delegates agenda setting to member state agencies while the Commission retains some control of what is started and the number of partners involved through funding competitions and its use of subsidy. The interest in the Nordic area in NoriaNets (Nordic Research and Innovation Area) and TAFTIE's (The Association for Technology Implementation in Europe) own discussions of TAFTIENets suggest that this scale of intervention is too big for some countries and that there is scope for similar initiatives at the level of Member States or networks of Member States, without necessarily involving the Commission. (In fact, many ERANETs appear to comprise an active core of participants and a larger periphery, who do not participate in calls for proposals, suggesting that in many cases a small network is the most relevant size.)

Generation 3. The European Technology Platforms, launched in the latter part of FP6, allow actors (especially industry) to self-organise to define research strategies, which they look to

[11] See Appendix 2 for organisation names.

the Commission or member states to fund. Some are evolving into Joint Technology Initiatives (JTIs) or Article 169 arrangements. Stakeholders involved do the governance but the Commission (and member states) hold the purse strings.

Generation 4. In the last two years, a new style of intervention has emerged through the European Institute of Technology (EIT), the Recovery Plan and the SET-Plan. These effectively invite stakeholders to build coalitions (Public-Private Partnerships – PPPs) that will co-fund R&D with FP7. They involve very large blocks of money (hundreds of millions and in some cases billions of Euros). Their governance comprises member state government representatives or other kinds of actors from the member state level. Unlike the ERANETs they do not appear to involve the agencies.

The emerging Joint Programming Initiatives (JPIs) will be governed at the overall level by a High Level Group of representatives of national ministries, associated with CREST (EU Scientific and Technical Research Committee). They will work rather like JTIs but will be public-public research cooperations. Interestingly, the impact assessment of Joint Programming argues that the governance of individual JPIs should be done via a "strategic European process" in which experts from the national level advise on individual initiatives. This would extend the tendency to work with expert groups in FP governance – following a somewhat academic governance tradition in which those who govern do not represent or coordinate other interests but lend legitimacy and expertise.

The introduction of the ERC in FP7 provided an extension of traditional academic self-governance into the FP and also an instance of NSF (National Science Foundation)-style funding of Principal Investigators, as opposed to the consortia that have in the past been necessary in order to generate EAV (European Added Value). Beyond the ERC, there is little in the FP that encourages exploration of new possibilities in a way that is detached from established interest groups.

At the time of writing, FP7 is approaching its mid-term evaluation and FP8 is actively under discussion. There is background assumption that FP8 may look very different from previous FPs –that it may be defined thematically via 'grand challenges' such as climate change, ageing, HIV/AIDS that are more social than industrial in nature and that there is a distinct possibility that the thematic project 'core' of the Framework may change radically compared to its current form, or even disappear.

3.18.4 What does this mean for Ireland?

The story of Irish FP participation is described in our report as involving a large 'spike' in FP4 because of a lack of national funding and because of Objective 1 status making Ireland an attractive partner to enhance proposals. Irish participation in FP5 and FP6 has been at a more 'normal' level, but Ireland's relative position in exploiting the traditional core of FP remains strong, partly because of enhancements to the size and capability of the HEI and BERD-performing sectors and partly because of national efforts to codify and exploit understanding about how to succeed in FP applications.

Our interviews with researchers suggest a lack of clarity about ERA and its goals – as well as lack of interest. That is perfectly reasonable – researchers tend to work within their own professional communities and incentive structures. Nonetheless, movement towards an ERA with fewer, stronger points of research critical mass would imply a greater need for national strategy. In particular, Ireland's chosen focus on (niches within) ICT (Information and Communication Technology**)** and biotechnology may need re-examination in the light of the high priority these themes have in most member states' policy, the less than encouraging

showing of Ireland in the Life Sciences theme in FP6 and the declining relevance of a strong European position to competition at the global level in ICT. Issues for discussion include the appropriateness of a bottom-up approach to niche selection within these themes and the extent to which focused international alliances should be pursued, using some of the new opportunities such as ERA-NETs and joint programming, or a more global strategy (i.e. acting outside Europe and the FP).

The newer generations of instruments discussed above provide significant opportunities for states to devise or influence the course of policy in a group of countries within the EU. Supra-national RTD policy is therefore less 'given' than before, providing opportunities for Ireland to influence more of the European agenda. Understanding and exploiting these opportunities will involve moving beyond Ireland's excellent history of exploiting the FPs' thematic priorities and tackling the issue of policy coordination. The Nordic cooperation shows that pursuing such joint activities at the scale of less than a handful of countries can be easier (less coordination cost) and more effective than working in large groups.

The Commission itself is moving to take more of a policymaking role. In the past it provided instruments for EU cooperation, but it is increasingly helping set wider priorities and to define instruments that could help to implement these. This can only sensibly be done in cooperation with the member states, so there is increasing 'policy space' for countries like Ireland to interact with and influence overall EU RTD policy.

Three types of action emerge from this discussion for policy consideration:

- The timing of the national choice of biotechnology and ICT as research foci means that it was made without the ERA context. It appears timely to review what that choice means for Ireland in a time of evolution towards ERA;
- Irish policymakers need to extend their view of the opportunities provided by the FPs from the traditional pursuit of advantage through the thematic priorities to negotiating RTD agendas with groups of states that have similar interests;
- Ireland needs to consider the growing opportunities to influence EU-level RTD policy and organise itself to exploit these, so that its interests are not crowded out.

4. Conclusions and recommendations

4.1 Conclusions

The results of the study have shown that Ireland's participation in FP6 was strong overall, and that its public and private research communities have played an active role in the Programme, deriving significant benefit as a result.

FP6 was considered to be of high relevance to Irish researchers. The programme's Priority Areas and Instruments were rated as an improvement on those employed in FP5, and proved a good fit with most researchers' requirements. However, demand for participation as measured by Irish participation in proposals was lower than might have been hoped, particularly within the Life sciences Priority Area.

Success rates within the competition were well above FP6 averages overall, and were particularly high in the Food quality and safety, Sustainable development, Research infrastructures and Euratom areas. Irish research institutes and public sector bodies enjoyed the highest success rates, while Industry's were much lower than for the other main groups of actors. Unsuccessful applicants have gained a good understanding of why their proposals were not supported, and many have taken steps to take their ideas forward through other support mechanisms or subsequent FP calls.

Irish participants were awarded a total of €199 million in FP6 funding, an increase in real terms but the same share of the total that was achieved in FP5. The share of FP6 funding awarded to Irish participants was in line with Ireland's share of GDP and its contribution to the EU budget, was significantly above its share of GNP and was very high in relation to the size of its population. Funding allocations to Irish participants were above the average amounts awarded during FP6 as a whole, driven mainly by higher than average levels of funding being achieved by Ireland's HEIs.

Participant numbers and participation levels were slightly lower in FP6 than in FP5. A combination of high success rates but falling levels of participation suggests that there is scope for further increasing demand among Irish research communities for participation in the Framework Programmes. Significant increases in national funding issued by the HEA, SFI and other agencies during the course of FP6 appear to have strengthened some actors' desire and ability to participate. However, it is clear that in other cases national funding has (understandably) diverted attention away from FP participation in the short term, with some research teams giving greater priority to the setting up of national research infrastructure and projects than to FP6 participation. It is expected, however, that the increased capacity and capabilities developed through national funding can and will strengthen participation in future Framework programmes among all groups of actors.

Irish organisations took part in all priority areas of FP6, and made use of all of the main instruments. In absolute terms participation levels and funding were highest in the Information society technologies and Human resources & mobility (HRM) areas. However, in comparison with other countries Ireland performed most strongly in the Food quality & safety, HRM, and Horizontal research involving SMEs areas.

Irish participants have played a very active role in the projects, and Irish coordination rates were well above FP6 averages. The FP6 priorities and instruments received positive ratings from participants, and while the larger scale of the projects and consortia during FP6 has

presented some challenges, most of the participants have been able to overcome these and derive significant value from their participation. Irish participants expressed reasonably high levels of satisfaction with FP6 administrative processes and procedures, and the balance of opinion was that these were better in FP6 than in FP5. Irish participants made good use of the support available during FP6 and rated the assistance received very highly.

A comparison of the motives for participation in Framework and the results achieved has shown that the Framework Programmes are effective at delivering the kinds of outputs and benefits that participants have sought. The formation of new networks and the exchange of knowledge and expertise were the primary motives for participation, along with a desire to access research funding. The primary benefits came in the form of improved relationships and networks, increased knowledge and capabilities (both scientific and technological), and enhanced reputation and image. FP participation has helped to strengthen and support participants' own research strategies, enabling them to extend their capabilities and pursue new lines of research. As a result, the benefits of FP6 participation have outweighed the costs for the vast majority of Irish participants.

The evaluation of FP6 has investigated early views on FP7, and the results are also positive, with most Irish actors considering FP7 priorities and instruments to be as relevant or of higher relevance than those of FP6. Ireland's new National Support Network introduced for FP7 has attracted significant praise, and the research communities appear to be making good use of the support on offer. Ratings of the main service providers and the assistance received are extremely positive, and there are some early indications to suggest that Ireland's participation rates may be higher under FP7 than FP6.

4.2 Recommendations

Ireland's success rates are already high, and so the major challenge in the short term is to increase the extent of demand for FP participation. While the significant increases in national funding issued by the HEA, SFI and other agencies during the course of FP6 have undoubtedly helped to strengthen national RTD capabilities and capacity, it was perhaps unreasonable to expect to see an 'immediate' increase in Framework participation at the same time as the national funding was being absorbed. However, it is essential that in the longer-term, national investments in infrastructure and capabilities are used as a platform for strengthened participation in international RTD initiatives.

We therefore recommend that the national funding agencies reaffirm the importance of FP participation and ensure that all of the major recipients of national funding are aware of and take seriously their responsibilities to leverage national money against other funding sources[12]. As a priority the non-involvement of key research groups and companies in FP proposals should be targeted. In parallel, the national funding agencies should ensure that appropriate incentive systems are in place, which encourage and give sufficient credit for FP participation. This would appear to be most needed in the Life sciences area where Irish participations in proposals was much lower than we might have expected.

[12] Some national funding programmes such as the Programme for Research in Third-Level Institutions (PRTL)I have now set explicit targets in this regard. All successful applicants to PRTLI Cycle 4, regardless of size of award, are required to leverage 15% of the total PRTLI Exchequer investment (capital and recurrent) from non-Exchequer sources over the period of PRTLI Cycle 4 investment (this is subject to the Department of Finance's guidelines and National Eligibility Rules for Expenditure co-financed by the European Regional Development Fund (ERDF) in 2007-2013).

We also recommend that the national funding agencies and their key constituents begin to develop strategies with regard to FP participation, assessing national research strengths and priorities and linking these to FP priorities and opportunities. It seems that some of the key players within the research base and the NSN already have a good understanding of where Ireland has been making the most of the available opportunities and where it has not. Such 'tacit' understanding should be underpinned by a more formal analysis, and then converted into a series of documented strategies as to how and where FP participation can be enhanced in the future. These strategies should form the basis for improved 'positioning' of the Irish research and industrial communities with respect to Framework participation, the establishment of EU partnerships and the influencing of future policy directions.

The Commission itself is moving to take more of a policymaking role, increasingly setting wider RTD priorities and agendas in cooperation with the member states. As such there is increasing 'policy space' for countries like Ireland to interact with and influence overall EU-level RTD strategies. New programming instruments provide opportunities for Ireland to take a stronger role in policy coordination and to influence more of the European agenda. The findings in this report suggest that Ireland is already beginning to play such a role, but a more concerted effort may be needed to ensure that the strategies of other actors do not crowd out Ireland's national interests. Active participation in the Joint Technology Initiatives and Joint Programming Initiatives and the negotiation of RTD agendas with other Member States is therefore essential if Ireland is to build on the recent investments it has made in its RTD base.

In addition, we make the following more specific recommendations for strengthening Ireland's participation in the Framework Programmes, most of which should be taken up by the national funding agencies through the NSN:

- Increase efforts to influence and provide early warnings of FP calls, with a stronger role in 'behind the scenes' negotiations in relation to FP priorities, and with National Delegates occupying a more central role within the NSN
- Provide increased support for identifying partners and building consortia, with increased help in building links with established EU players and increased incentives for intra-Ireland collaboration, particularly where Irish participants are in a coordinating role
- Provide increased levels of support from 'experienced campaigners' in reviewing draft proposals and advising on critical success factors
- Encourage increased levels of participation by Irish researchers within the FP evaluation process, in order to enable an improved understanding of how it operates and how to maximise chances of success
- Increase the use of dedicated (professional) management support, to assist in the development of proposals, drawing up of contracts, and management of large-scale projects
- Improve the balance of support provision, with a better regional distribution and a greater focus on support to industry
- Provide more flexible forms of financial assistance, including the option to claim travel grants retrospectively and selective provision of matched funding in strategically important areas to support FP participation

- Strengthen the promotion of the support available, particularly to less established and new participants in order to ensure that the assistance is given to those who most need it
- Evaluate on an ongoing basis the effectiveness of the support provision, in order to understand whether the increased investment is producing the desired results, overall and at the level of the different elements, particularly the financial supports

The current economic climate brings forth the prospect of ever more serious cutbacks in national funding for R&D, and it is therefore vital that the upgrading of Irish research capabilities that has been taking place over the last decade can be exploited and further developed through FP participation. The measures set out above should provide an improved basis for ensuring that this can happen.

Appendix 1

Steering Committee

Organisation	Name
EI	Imelda Lambkin / Catríona Ward
HEA	Gemma Irvine / Sarah Dunne
IDA	Jim Whelan
DETE-OST	Bill Brandon
IUA	Conor O'Carroll / Dagmar Meyer
IRCHSS	Sorcha Carthy
IBEC	Aidan Sweeney
Forfás - Chair	Karen Hynes
Forfás - Secretary	Catherine MacEnri

Appendix 2

Terminology

Participant:

Participants in FP6 projects are *legal entities* contributing to an indirect action and having rights and obligations with regard to the Community and to one another under the terms of the Rules for Participation and the *model contract*. Under the contract with the Community participants are referred to as *contractors*. The word 'Participant' is sometimes interchanged with the word 'organisation' in this report.

Project:

Research (or other) project resulting from the proposal i.e. a successful proposal results in a project. Research projects in the Sixth Framework Programme are implemented using particular 'instruments' that specify how the work is to be organised and funded. FP6 introduces two new instruments –Integrated projects (IP) and networks of excellence (NoE).

The integrated projects (IP) instrument is designed to **generate the knowledge** required to implement the **priority thematic** areas. The Networks of Excellence (NoE) instrument is designed to **strengthen excellence** on a particular research topic by integrating the **critical mass** of resources and expertise needed to provide European leadership and to be a world force in that field.

Participation:

When a participant is funded to participate in a particular project it is referred to as a participation. The number of participations will always be greater (or equal) to the number of participants as a participants can participate in any number of projects.

Funding:

European Commission funding to the project

Research Institutes: For the purposes of this study Research Institutes are those organisations that are called Public Research Organisations (PROs) in Ireland.

Appendix 3

Glossary

List of Acronyms

BERD	Business Expenditure on Research and Development
CA	Coordination Action
CERN	European Organisation for Nuclear Research
CIP	Competitiveness and Innovation Programme
CLR	Collective Research Project
COST	European Cooperation in Science and Technology
CRAFT	Co-operative Research Project
CREST	EU Scientific and Technical Research Committee
DCU	Dublin City University
DERI	Digital Enterprise Research Institute
EAV	European Added Value
EC	European Commission
EI	Enterprise Ireland
EIT	European Institute of Technology
EMBL	European Molecular Biology Laboratory
ERA	European Research Area
ERC	European Research Council
ERDF	European Regional Development Fund
ESF	European Science Foundation
EU	European Union
FP	Framework Programme

GDP	Gross Domestic Product
GNP	Gross National Product
HEA	Higher Education Authority
HEI	Higher Education Institute
HRM	Human Resources and Mobility
I3	Integrated Infrastructure Initiatives
ICT	Information Communication Technology
IDA	Industrial Development Agency of Ireland
II	Specific Actions to Promote Research Infrastructures
IP	Integrated Project
IPR	Intellectual Property Rights
IRCHSS	Irish Research Council for the Humanities and Social Sciences
IRCSET	Irish Research Council for Science, Engineering and Technology
IST	Information Society Technologies
IUA	Irish Universities Association
JPI	Joint Programming Initiative
JTI	Joint Technology Initiative
MCA	Marie Curie Action
MNC	Multi-National Company
NCP	National Contact Point
ND	National Delegate
NoE	Network of Excellence
NORIA	Nordic Research and Innovation Area
NSF	National Science Foundation
NSN	National Support Network
NUIG	National University of Ireland, Galway
NUIM	National University of Ireland, Maynooth

OST	Office of Science & Technology
PRTLI	Programme for Research in Third-Level Institutions
R&D	Research and Development
R&I	Research and Innovation
RD&I	Research, Development and Innovation
RTD	Research and Technological Development
S&T	Science and Technology
SFI	Science Foundation Ireland
SME	Small and Medium-Sized Enterprise
SSA	Specific Support Action
STREP	Specific Targeted Research Project
TAFTIE	The Association for Technology Implementation in Europe (The European Network of Innovation Agencies)
TCD	Trinity College Dublin
UCC	National University of Ireland, Cork
URO	University Research Office