Assessment of the impact of the new instruments introduced in FP6

A study for DG Research
Final Report

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1 Executive Summary

1.1 Introduction

This study forms part of the work contributing to the ex-post evaluation of the Sixth European Framework Programme on Research and Technological Development, and looks at two new instruments introduced in FP6. These were specifically designed to contribute to the objectives of increased co-operation, improved competitiveness, greater complementarity of research and improved co-ordination within the Programme and with other national and international programmes. To do this, the new Integrated Projects have the objective of helping to build “critical mass” in objective driven research, and bringing together large research teams. The Networks of Excellence aimed to progressively integrate the activities of the network partners and linking national centres of excellence, providing frameworks for the exchange of researchers and the sharing of data and facilities.

Together these instruments aimed to address the specific issue of fragmentation in European research capacity and capabilities.

Following the introduction of the instruments a number of studies were carried out some, such as the report of the panel chaired by Professor Marimon1 looked specifically at the instruments, others raised issues in the course of wider reports. These raised a number of concerns:

- A lack of clarity in the implementation of the goals
- The reorganisation into a small number of large projects leading to high rates of oversubscription, and potential frustration
- Initially a rather inflexible approach
- An emphasis on size, rather than critical mass in the context of the individual research areas
- The apparent initial requirement for large consortia leading to cumbersome and costly proposal processes, and lengthy evaluation processes
- A lower level of participation from SMEs and New Member States
- A perception that the new instruments discouraged scientific risk

The study used a survey of participants, interviews with key players, statistical analysis of the programme and 30 case studies of projects to bring together views on the two instruments to address these, and instrument specific concerns.

1.2 Overall findings

On the whole the instruments have been perceived as a positive addition to the suite of mechanisms available under the Framework Programme. Although some time has been needed in order to understand and embed them in the system some of the earlier criticisms from previous studies have in the most part already been addressed. They have proved particularly positive in the development of interdisciplinarity and overcoming fragmentation in particular areas (the NoEs ) and also in supporting new researchers through new knowledge, relationships and mobility (both IPs and NoEs). As such they contribute to the objective of creating a European Research Area. Most participants’ primary motive for participating was to ensure a presence in the international research area and to develop new or improved relationships.

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The size of projects rose in the Sixth Framework Programme – both in the new instruments and in the rest of the programme – the average number of partners rose from 5.1 in FP5 to 7.2 in FP6. The funding by partner also rose by 13.5%, although in real terms this was a relatively small increase. Most apparent was the major decrease in the number of projects, with a resulting decrease in the overall number of participations\(^2\) by 10,000.

The size of the projects within the new instruments varied across the programme, with IPs having a mean size of 25 participants (ranging from 4 to 75), and NoEs having a mean size of 30 participants (ranging from 9 to 116). The pattern varied across the thematic priorities, with the Networks in IST, Sustainable Development and Euratom having a much larger mean number of partners than Nanotechnologies, or Aeronautics and Space. On average the IPs in Food Quality and Safety were the largest while both types of project had a lower mean number of partners in the area of Citizens and Governance.

The NoEs were dominated by higher education and research organisations with very little participation from industry of all sizes, but there was a higher level of participation in the IPs. While this pattern did vary across the priorities, the overall picture was consistent. However, overall the level of participation from industry declined compared with FP5, with the level of participation from SMEs being particularly affected.

Concern about the level of participation from new Member States was also confirmed – not only did their overall participation level fall, but the level of participation in the new instruments as a proportion of their overall participation was extremely low. The participation from smaller countries overall in the new instruments was also lower than expected. However, the NMS participants did express the view that a small participation in one of the new instruments was a stepping-stone to more significant participation in the future.

The distribution between the instruments was largely prescribed in the work programmes and calls – both the distribution of the budget and the allocation of instruments to research topics – thus participants had relatively little say in the adaptation of instrument to the proposed research. This did not change over the life of the programme, neither did the distribution between the IPs and Specific Targeted Research Projects (STREPs). However, there was a major decline in the funding and number of Networks of Excellence over the life of the Programme.

1.3 The Integrated Projects

In addition to the overall concerns, the IPs raised questions regarding the scale of consortia and the possible benefits of smaller groupings, difficulties of management and intellectual property rights within large consortia, and the appropriate overall balance between the IPs and the traditional smaller projects.

The issue of lack of clarity on the objectives of IPs and the differences between IPs and STREPs were confirmed both by participants and by their advisers (for example the NCPs) who also had initial problems. There was also a general agreement (especially among participants from the EU15) that the IPs had too many partners. What the optimum level was considered to be varied between priorities but generally fell within a range of 10-20 partners. However, the case studies showed that the projects were generally flagships in their fields with main outputs of publications and new or improved techniques or processes, together with new knowledge and relationships.

The IPs used a programme method of implementation, with an ambitious approach that often required them to be multi-disciplinary even when this was not a direct objective of the project. Integration had occurred across the research spectrum and this was considered beneficial. Novel working relationships were formed, especially new relationships with new partners expected to be enduring – one side effect of the increase in scale being the need to bring in “new blood”. Particularly important is the finding that scientific and financial risk was considered

\(^2\) Organisations may participate in more than one project
to be unchanged under FP6, despite fears that the larger projects might lead to a more conservative approach.

However, increases in scale were accompanied by increased complexity leading to increased management time and costs (not reflected in programme budget allowances), difficulties in arranging issues of intellectual property, and an overall increase in levels of bureaucracy. Participants were more constrained in their approach to the research by the work programmes than in previous programmes, but during the actual project found that flexibility had increased. Not all partners were equally involved in the projects, but the involvement of SMEs was often limited to specialist roles in the projects.

1.4 The Networks of Excellence

The main additional concerns for the NoEs were that the concept of durable integration was not well understood at the start of the programme, and the networks were lacking in real continuation or exist strategies. There were also tensions between the need for excellence and the overall programme objectives of inclusiveness – particularly towards less advantaged groups such as SMEs and the new Member States. A further issue raised was that NoEs could not directly fund “traditional” research activities, although they could and did fund research on supporting or integrating topics.

There was large diversity in the nature and scale of the projects, but overall only 38% of study respondents felt that the projects were too big (compared to 61% for IPs). Although scale was initially seen as an issue, over the life of the projects it became seen as a strength, and most participants felt well involved in the network. The main motive for participation was to ensure a presence in the European field, with the main results being new publications, and follow-up research projects, training courses and conferences and the new organisations and permanent networks that were objectives of the instrument.

The networks needed active involvement from the participating institutions at the strategic level from the beginning. They were successful in generating new relationships, new activities and new research, but there were some doubts as to the extent to which lasting relationships were being generated at the institutional rather than the personal level. The level of support from the national research structures was also disappointing. They provided good opportunities for involvement of young researchers, but the lack of funds for “traditional” or direct research was considered a limiting factor, as did the limited funding resulting in the network activities forming only a limited part of participants’ overall activities.

1.5 Conclusions

The instruments have met with more success than was originally expected, showing that many of the issues highlighted at the start of the programme have been addressed. In particular, although the Networks of Excellence have received a mixed press generally, the level of support from participants was generally high, and it appeared that sustainable effects of participation would emerge. The IPs worked well in fields where either the research area or the sector structure involved large players. They were more problematic in more fragmented areas.

However, there remains a number of issues to address and these are covered in the conclusions outlined below.

- Design issues
- Implementation
- Impact/Value added

1.6 Design

- The rationale for the instruments is clearly expressed and generally understood in terms of overcoming fragmentation and bringing people together at a sufficient scale to have a significant impact on the structure of European research.
• However the translations of the rationale into the specifications of the instruments caused some confusion for participants, particularly in the use of the concepts “critical mass”, “networks”, “excellence” and “integration”.

• In particular for NoEs, the original objectives of the instrument and the novel structure are reported as causing confusion. However overall the results from this study show a much higher degree of clarity in participants and a positive attitude towards the benefits of NoEs.

• The need for the instruments did not change dramatically over the period of the programme although there were some adjustments in the European research landscape. Other structuring instruments were also developed over the course of the programme but were considered to be complementary rather than competing.

• The Marimon report recommended a rebalancing between IPs and STREPS and a slight increase in STREPS and decrease in IPs was seen. There was also a clear decline in the number of NoEs in line with the strong decrease in the number of participants and EU funding.

• Overall in the period covered by the projects there is little evidence of a major structuring impact. In part this may be due to the implementation of the instruments. There may be more evidence in the Seventh Framework Programme as the majority of the FP6 projects are long in duration and therefore impacts are only now emerging.

1.7 Implementation

1.7.1 Implementation of the instruments

• As already highlighted, the main issue for implementation was the confusing terminology or lack of clear explanation when the instruments were introduced. This persists to some extent, in spite of concerted efforts to address this issue. In NoEs, the interpretation of the term “durable integration” and “networks” has perhaps led to an emphasis on science and research rather than organisational integration, which has impacted on the aforementioned durable integration. In IPs the size and interpretation of critical mass had been identified as a contentious issue in both the survey and previous studies.

• The issue of perception and understanding of the instruments was not helped by the way they were introduced in the work programmes and calls. The European Commission were initially quite prescriptive as to what instruments could be used. In some instances (eg in IST) the bulk of the initial budget was allocated for the new instruments with little understanding of what they were aiming to achieve. This led to frustration due to low success rates (fewer projects were funded due to their large size) and the exclusion of some of the smaller players.

• The initial mistakes in implementation of the work programmes were corrected in the lifetime of the programme. In FP7 even more flexibility and clarity can be seen with participants more able to define levels of critical mass for example, in the research areas proposed.

• A number of supporting activities, including the calls for expressions of interest, were designed to increase involvement and the constitution of consortia, but these for a did not add to the clarity of the objectives.

• In the case of Networks of Excellence, there was a more fundamental design issue. The fact that Networks could not fund direct research was cited as a major stumbling block to durable integration. This may result in two issues – projects finding creative ways to fund activities that are close to research but can be classified as ‘not research’ or some networks not being able to fully absorb their funding. This is something that is early to assess but needs to be kept under review.

1.7.2 Implementation of the projects

• The administrative burden of integrated projects has been noted and the European Commission are already aware of this issue.
The regular reporting requirements were particularly difficult for the coordinating institutions. The budget for coordinating projects had not changed from the previous smaller instruments and was therefore felt to be inadequate.

The need to write a project plan every 18 months was found to be excessive work, although some coordinators also used this as an opportunity for introducing flexibility.

Adding new partners or partners leaving led to disproportionate levels of administrative procedures.

Coordinators considered that sub contracting would be a useful mechanism, particularly when SMEs were involved in projects, reducing their administration requirements.

The principle of collective responsibility was reported as one of the most burdensome and hindering factors for large IP consortia.

1.7.3 Participation issues

New Member States involvement continued to be at a lower level that the EU15. In some thematic priorities the low level was more marked than others. Although this may reflect national research strengths, there remains a noticeable difference between the EU15 and the NMS. Hardly any NMS led an IP or an NOE.

However, in spite of a lower level of participation, NMSs rated participation in IPs, for example, as a very valuable entry point into the European research arena. NMSs were more likely to cite access to capabilities and facilities that do not exist in their country as an important objective for participation. Additionally, for NMSs it was thought that future participation in FP7 might be dependent on at least marginal involvement in an FP6 project.

SME participation continues to be low although proportional to overall industry involvement. SME involvement in IPs tended to be for more specialist services in one work package area.

1.8 Impacts/Value added

Overall is it still early to judge real impact, which is best seen once some time has elapsed and that a comparison could usefully be made at the end of FP7. However there are some good indications of the early impacts the projects have made in terms of integration.

In the view of the participants the integration achieved in the projects has contributed to the development and consolidation of the European Research Area.

In the view of the NCPs and the European Commission the instruments have contributed towards structuring and strengthening the European Research Area. Therefore although the views are complementary, there are slight perceptual difference between the participants and Commission and the NCPs.

The critical role of the coordinator was emphasised in both IPs and NoEs with a need for strong leadership and good organisational skills in the coordinating institution. Integration within projects was best achieved where objectives were clear and well communicated.

Networks of Excellence require an active involvement at the strategic level of participating institutions from the start. The balance of impact between the individuals and the institutions was an issue for NoEs. There was some concern that the network remained with the individual researcher rather than being embedded at the institutional level.

In some cases the NoE has played a catalytic role in building and sustaining new relationships for future cooperation in fragmented research areas.

Overall, both instruments put emphasis on the impacts of new relationships and new knowledge rather than new commercial applications. New research activities were also highlighted as being developed. The opportunities for post docs and new researchers were highlighted in both instruments as being positive.

Interdisciplinarity is highlighted as a key factor in the success of the NoEs.
• In terms of size of IPs, there is a need for balance between the benefit of bringing together a large group and the difficulty in coordinating and organising a consortium. The benefits of larger projects were seen in some of the more fragmented research areas. Projects that had more difficulty integrating were those with more theoretical objectives.

• The NoEs were in general considered to be of the right size. The results showed that the common perception that NoEs are too big to function satisfactorily is not true. Although in the beginning there were a number of concerns, as the networks matured, the participants were able to appreciate the added value they returned. The case studies evidenced that the diverse composition of the networks and the large size of consortia was actually a key strength of an NoE as long as it was well coordinated.

• The term ‘critical mass’ was interpreted in a variety of ways among the project participants. The most common perception is that critical mass is achieved through integration of multiple disciplines and sectors to achieve common goals.

• Other than bringing together large consortium, many participants were still unclear about the overall objectives of the integrated projects and in a small minority, of the difference between IPs and NoEs.

Thus, as stated above, the overall view on these instruments is positive, with evidence that this is a trend that has grown as the instruments have become more established and as the corrective measures have borne fruit.

What also emerged was that there are significant differences in the structure of the research constituencies across the programme. This leads to different requirements for research instruments and the balance between them. An overly prescriptive approach imposing uniformity risks not meeting the needs of the various sectors and their constituent organisations. The strength of the instruments lies not only in their intrinsic abilities to contribute to the realisation of the ERA, but in their complementarity with the remainder of the research and innovation instruments at national and at European level.
2 Introduction

2.1 Background to the Assignment

This assignment forms part of the suite of background studies undertaken to provide information to the expert panel that examined the various elements of Sixth Framework Programme for Research and Technological Development (FP6).

The introduction of FP6 saw a change in the overall strategy of the programme with the formal commitment to the development of the European Research Area and the associated objectives of increased co-operation, improved competitiveness, greater complementarity of research and improved co-ordination within the Programme and with other national and international programmes. The focus was thus on integrating, structuring and strengthening the European research effort.

In order to assist in achieving this, new instruments were created for the implementation of FP6, which ran from 2002-2006:

• Integrated Projects (IPs) were projects of substantial size, designed to help build up the 'critical' mass in objective-driven research with clearly defined scientific ambitions and aims. IPs, a break with the FP’s focus on smaller projects, aimed to bring large research teams from the private and public sectors in at least three countries together to develop strategic technologies.

• Networks of Excellence (NoEs) aimed at progressively integrating activities of network partners and thereby creating 'virtual' networks of excellence. NoEs were designed to link up national centres of excellence, providing a framework for the exchange of researchers the sharing data and facilities.

Together these instruments aimed to address the specific issue of fragmentation of research capacity and capability across Europe.

These instruments were introduced alongside the traditional type of project (now designated as Specific Targeted Research Projects or STREPs), and a range of supporting actions. Also developing during the course of the programme were other structuring instruments such as Technology Platforms and Eranets (which were the subject of separate studies) forming part of the overall research effort.

2.2 Objectives of the Assignment

This study aimed to examine the effectiveness, implementation and impacts of these new instruments for collaborative research that were introduced in FP6. A first assessment of these instruments was carried out for the Framework Programme in 2004 by a high level panel under the chairmanship of Professor Ramon Marimon3. A study was also carried out for the IST thematic priority following the first two calls of FP6. This study aims to follow up the results of the earlier studies, including the effects of the corrective measures introduced following that study. However, this study is also able to examine the important issues of impact and sustainability in a way that was not possible at the time of the first studies, when most projects were still at the beginning of their operations. In addition to these two early studies, a high-level

group also examined the Network of Excellence\textsuperscript{4}, and the results of that are also taken into account.

This study is focused on the new instruments, and direct research was addressed only to participants in those instruments. However, the composition analysis also examines the instruments as part of the overall portfolio of the Framework Programme.

The study was designed to have two key elements. The first element is an \textit{ex post evaluation section} that looks specifically at issues surrounding the effectiveness of the implementation. This includes:

• The clarity and robustness of the original concepts
• The quality of the support from the Commission and within the participating countries
• The level of support to the applicants
• The consistency of the evaluation process
• Managerial issues during the implementation of the projects

The second element is an assessment of the \textit{impact and added value} of the instruments. This focuses on indicators of change, looking not only at the measurable changes in project construction but behavioural changes in the participants themselves.

While the report will examine both the new instruments, they were designed to meet different objectives, and therefore elements of the data collection and analysis will be designed to look at each of the instruments against its own specific objectives, as well as the overall strategic objectives of the changes.

2.3 Purpose of the Final Report

This Final Report is part of the final deliverables for the evaluation of the effectiveness, implementation and impacts of the new instruments introduced in FP6.

The report brings together the results of the three elements of the research – the survey, the case studies and the interviews and sets out the findings and recommendations.

2.4 Structure of the report

The main section of the report covers the key findings from the survey with the conclusions from the interviews and case studies incorporated. It then discusses the issues and main conclusions arising around the key evaluation questions.

A summary of the overall findings of the survey and the case studies are attached as an annex to the report, together with the questionnaire.

3 Key issues

The following chapter includes a review on the key issues with regards to the Integrated Projects and Networks of Excellence. The description has been divided into two sections including general issues that are common to both instruments and specific issues that relate to one instrument in particular.

3.1 General issues

The general issues fall into internal or management, factors dealing with design and implementation, and wider or external factors to do with the objectives and impacts of the

The effectiveness, implementation and impacts of new instruments introduced in FP6

Here we have attempted to indicate their implications for the study.

**Figure 1 Main general issues**

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<th>Implication for study</th>
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<td>Lack of clarity in the goals meant that there was apparently some initial confusion as to the role of the various instruments. This was specifically the case for the STREPs and IPs where there was apparently a tendency on some parts to view IPs as &quot;very big STREPs&quot;.</td>
<td>Following the first review a concerted effort was made to differentiate the two instruments. The study attempted to see whether any change could be discerned as a result of this activity.</td>
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<td>The use of a small number of large projects under these instruments led to oversubscription and potential disillusionment: for example, while the response rate to the first calls of FP6 was very high, only 17% of applicants received funding, which suggests that the criteria had not been laid out clearly enough.</td>
<td>Again this was subject to clarification for subsequent calls. Success rates should be examined to see whether there was better targeting of the instruments as a result.</td>
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<td>The new instruments were initially characterised by a high degree of inflexibility. For example, under FP6 certain calls were limited to certain instruments, with the risk that proposals were adapted to potentially unsuitable instruments in order to heighten their chances of receiving funding. Instead, it was proposed that the instruments allow increased flexibility for participants so that researchers could select the most appropriate instrument to meet their research objectives. The Commission in its response to the Marimon Report rejected this recommendation, preferring to have more explicit and targeting in drawing up the work programmes.</td>
<td>The changes in the drafting of the work programmes were reviewed to see whether this took place. The requirements for FP7 were also compared to the FP6 initial guidelines.</td>
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<td>There was a distinct emphasis on size of projects and 'critical mass', whereby the new instruments tended to favour large consortia. However, there was very little clear definition of critical mass or recognition of the fact that the definition depends on the topic, the thematic area, the participants and the potential impact and added value. As a result, the concept of 'one size fits all' that seemed to underlie the new instruments should not be applied across all thematic areas and Instruments.</td>
<td>This area was subject to a concerted effort at clarification, and the pattern of project size over the life of the Programme was examined. Questions as to the real level of participation by the partners in very large projects were included in the survey.</td>
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<td>In addition, the very fact that the new instruments seem to require (at least the way participants initially interpreted the guidelines) a large number of participants made the whole process of proposal writing, consortium formation and project management especially time-consuming, cumbersome and costly.</td>
<td>The evolution of the proposal and management requirements over time, and the issue of simplification in FP7 were taken into account. This should also include issues of the implications of over-subscription.</td>
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<td>The evaluation procedure was seen as lengthy and complex. There was a demand for the introduction of more 2-stage proposals and for remote evaluation.</td>
<td>The documentation and explanations of the evaluation criteria were updated. The implementation of 2-stage proposals in some programme areas should be examined further.</td>
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<td>Low SME participation: Although FP6 stipulated a 15% target for SME participation, the level achieved initially was disappointingly low.</td>
<td>The level of participation and its evolution was looked at for the different research areas and related to the industry structure. In addition the actual role of the SMEs in the consortia needs to be addressed to ascertain the extent to which they are involved in the actual research activities, rather than as</td>
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The new instruments also seemed to discourage participation from the new Member states (indeed their participation in FP6 grew very slowly) and emerging research groups. This might have been related to the issues of complexity and lack of capacity in the new Member States although there were also issues related to a lack of access to matching funding in some countries at the beginning of FP6 at least. The rate of NMS co-ordinators of projects was very low indeed. Differences between the NMS needed to be examined further. It was also important to differentiate between number of participations and levels of funding attracted, since in some cases these were very different.

The extent to which the new instruments stimulate scientific risk taking was raised as an issue. This is an area that was further investigated in the survey and the case studies.

3.2 Instrument-specific issues

3.2.1 Networks of Excellence

NoEs had met with a significant level of criticism (although the general underlying concept of structuring and strengthening the ERA was welcomed). Problems with the processes were among the criticisms but the major problem identified was the concept of "durable integration". According to the Commission's own assessment, integration and durability were either misunderstood or ignored by representatives of NoE Governing Councils (participants' management) with the result that long-term binding commitments to support the Networks were apparently rare. This risks re-fragmentation when EC funding ends. Indeed, many NoEs correspond to 'close cooperation', thus falling short of the expected research capacity 'integration'. How this durable integration can be demonstrated is an issue; examples of the formation of new legal bodies, for example, do exist, but in many cases it is rather soon to say whether this is a potential result of the project.

For the more recent projects, the future of the network after the cessation of funding is an issue that has not yet been concretely addressed.

Another issue for NoEs (and for some IPs) has been the tension between the sometimes incompatible demands of achieving both excellence and inclusiveness. In addition, the participation of industry, particularly SMEs, in NoEs has been particularly low.

The activities of the NoEs did not include funding for carrying out research as such\(^5\). The extent to which this was an issue was explored in the survey and the case studies.

3.2.2 Integrated Projects

IPs received more favourable comments and in general there seemed to be less concern about this as an instrument in the longer term. However, as with NoEs, processes such as building consortia, proposal submission, proposal evaluation and contract negotiation were the subject of widespread criticism. It was proposed following the Marimon report that IPs involving smaller consortia should also be welcomed. This was accepted by the Commission but debated in the Council. In principle the Commission subsequently clarified and stressed the integrating nature of the IPs, involving several phases of the research process and a more programmatic approach. The large consortia that were involved in IPs encountered not only management but also IPR difficulties. In addition, there was confusion between IPs on the one hand and STREPs on the other. With regard to STREPs it was recommended that they play a larger role as a

\(^5\) NoEs could carry out research linked to or supporting the integrating activities of the network, but not "traditional" co-operative research.
funding instrument again, a notion accepted by the Commission but debated in the Council. These issues of scale were examined in the study to take into account not only these issues but also those relating to the management of the projects and the subsequent sustainability of the relationships developed as a result of the collaboration. The issue of consortium size over time and changes in composition with the introduction and potential departure of partners was also examined – both from the database and from the case studies. The difference in consortium size and the relevant definition of critical mass between the research areas was examined in the composition analysis and the questionnaire and case studies.

4 Main methods used

The chapter describes the various data collection methods the study team used in order to obtain a comprehensive overview on the new instruments. The results of the various data collection methods: analysis of existing reports, participants’ survey, interview programme and case studies are synthesised separately in chapter 5 (IPs) and 6 (NoEs) by instruments.

4.1 Analysis of existing reports

We examined the various documents associated with the new instruments, starting from the legal base and the programme implementation documents, including the various guides made available to the potential participants and the project evaluators. We also studied the various evaluation reports that take into account the new instruments – directly or indirectly. This therefore included the Marimon report, and also various studies forming part of the evaluation of FP6. It also includes the Independent Rapporteur Report on three dedicated Workshops on the main FP6 instruments held in March 2006, which looked at fine-tuning the instruments in preparation for FP7, in addition to the Final Report of the Expert Group on the Future of Networks of Excellence (hereafter Expert Group). Throughout our study there has been comparison of the results of the Marimon report and the findings of the Expert Group on the Future of NoEs with the conclusions of the current study. However, to obtain an overview on the two reports, the following subchapters provide a short description on the main topics of the studies.


The Expert group found the objectives of the NoE scheme ambiguous. NoEs were initiated in order to address the “fragmentation” and deficits in “critical mass” that had been identified as a problem in research in Europe.

The report found a great deal of variety in the performance of NoEs and identified a number of categories, and overall only a minority successfully moved towards durable integration.

“In the expert group’s view, the NoE scheme was successful to a limited extent only especially with regard to its general objective of developing integrated and sustainable “virtual centres of excellence”

However, the report found the NoE experiment was useful in demonstrating that collective goods can be produced that would not occur from other arrangements. Several areas of achievements of NoEs were identified:

• Developing joint programmes for research activities including: collaborate research projects, combining complementary fields, fostering excellence through competition, developing common working methods, and addressing issues with European added value
• Pooling scientific equipment for joint use and development including establishing: common methodologies, joint agreement of approaches for data collection and treatment, developing joint databases
The effectiveness, implementation and impacts of new instruments introduced in FP6

- Providing a favourable environment for young researchers
- Offering transnational integrated advanced education and training services
- Ensuring science policy interface, including society involvement and public awareness
- Supporting European and international visibility and competitiveness

The report also described a number of difficulties encountered in implementing NoEs. The main challenges related to integration, and difficulty reconciling different interpretations, perceptions, and approaches. This was in part thought to be due to the ambiguity of the definition of NoEs. The general view was of a need to include a large number of partners that generated “first wave” of very large projects. In addition, the NoE scheme was not seen as an opportunity for organisational development and support for creation of new structures for coordinated R&D. NoE partners often interpreted the instrument as being like Thematic Networks or Coordination Actions, loosely grouped for flexible self-organised financial resources for small scale research projects and activities – more like a small out-sourced research programme. Most NoEs emphasised science and research activities, not organisational integration, partly because NoEs were called “Networks”, a misleading term. Interpretation of “durable integration” varied with many organisations seeing alignment of concepts/methods as integrations especially for the IST thematic priority. Some NoEs thought of structural/organisational change as contractual arrangements leading to joint legal entities (as defined by the original objectives). Overall, researchers focussed on research activities, while the scientific officers at the Commission focussed on project monitoring, and organisation (administrative) integration, sometimes despite progress in scientific integration.

The expert group concluded that participation of industrial partners should not be a requirement for NoEs: large companies have their own cooperation strategies, find NoEs too unclear, and “durable integration” is not an attractive option to them, and the finances are not attractive to them; SMEs prefer local cooperation, and long-term contractual commitment is a problem for SMEs. Instead industry could play a role as advisory boards – needs further discussion. Furthermore, there was a variety of approaches towards management of NoEs, and there have been problems with the implementation and follow-up of NoEs. According to information from several coordinators financial management problems were caused by frequent change of financial officers. Researchers see the reporting requirements as a burden, whereas reporting should be a tool for monitoring (both scientific and administrative). The large partnerships led to administrative overload for the management group.

4.1.2 Evaluation of the effectiveness of the New Instruments of Framework Programme VI

The key finding of the panel was that the new instruments had the potential to be a powerful means to support transnational research and should be continued into FP7 to enable a degree of continuity, but that there were a number of aspects of the design and implementation that needed to be improved – with some of those improvements being implemented in the latter part of FP6.

One of the main findings was that the work programmes and calls should be less prescriptive as to which instruments were appropriate and enable participants to select the most appropriate way to proceed. This required a clear classification of the instruments and clarity of guidelines and criteria for proposers.

The issue of scale and what constitutes “critical mass” was examined and it was recommended that the onus to define and prove that the consortium attained the appropriate critical mass for the topic, the thematic area, the participants and the potential impact and added value for both instruments should lie with the proposers.

For Networks of Excellence the main issue arising was the concept of “durable integration” and, as for IPs, improvements were needed in the processes of consortium building, proposal

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6 Report of the independent Panel of high-level experts, chaired by Professor Ramon Marimon
submission, proposal evaluation and contract negotiation. The difference in scope and objectives of the IPs and STREPs needed also to be clarified.

It was recommended that the balance of the instruments – especially between the IPs and STREPs – should be adapted in the remainder of the programme, so that the smaller instruments could encourage risk-taking, industry involvement, participants from new Member States and participation of smaller players in general. The involvement of SMEs was an issue of particular importance, especially given their very low level of participation in the NoEs and comparative lack of involvement in the IPs.

4.2 Survey of participants

4.2.1 Introduction

The survey was undertaken at the level of the participant, rather than individual projects. This gave us a number of advantages:

- The issue under examination was the instrument, not the project – we were therefore able to examine the participants’ cumulative experience of the instruments.
- Where there were multiple participations7 from the same organisation with the same contact then this would enable them to comment on comparative experience potentially across instruments
- Where there were multiple participations from the same organisation with different contact persons named we counted these as separate instances of participation since they may have participated in different programme areas with different resulting views.

For the analysis we used the thematic priorities of the Framework Programme with the exception that we have split the aeronautics and space domains since they are different in character, and now fall within two separate areas within FP7 and are the remit of two different DGs. In order for the findings to be of maximum use this seemed a sensible step involving minimum effort on our part.

We also considered the issue of the programme areas that are no longer covered by FP7 but rather by the CIP. In this case we have not separated these out since this concerns the area of innovation, where there is marginal use of the new instruments and some areas of IST, which it would be relatively complicated to separate out. This is mainly an issue for the analysis of comparative data between FP6 and 7 if available.

4.2.2 The questionnaire

Because of the large number of questionnaires in circulation at the time of the survey, there was an imperative to keep the length to an absolute minimum. After consultation with the contractors for the two other questionnaires covering the largest part of our sample we ensured that there was as little overlap as possible between the questionnaires.

The survey was organised into three main sections with an introductory page and a copy of the authorisation letter. Forty three percent of respondents chose to view this letter, which suggests that it might be a valuable addition to future surveys of this nature. The survey comprised a mix of simple multiple-choice and more advanced Likert scale questions to probe into the key aspects of Integrated Projects and Networks of Excellence. The basic structure of the questionnaire was as follows: participation

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7 There is a distinction in the report between participants, which are considered as single research entities, and participations, which are individual memberships of projects – thus one participant may have several participations.
Figure 2 Questionnaire structure

This ensured that participant were only asked questions on the instruments in which they had participated. The survey was sent to all participants for whom we had contact details – it was decided that the views of all participants should be sought. This was especially the case for the NoEs where the level of participation was an issue in itself.

The questionnaire is attached in annex to the report.

4.2.3 Survey Sample

From the database we were able to extract the records of those organisations participating in the new instruments. This gave the following result:

Figure 3 Survey database

<table>
<thead>
<tr>
<th>Number of Email Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total participations</td>
</tr>
<tr>
<td>Of which NoEs</td>
</tr>
<tr>
<td>Of which IPs</td>
</tr>
<tr>
<td>Total relevant</td>
</tr>
</tbody>
</table>

This was then filtered to remove duplicate instances of participants and those with no contact details, resulting in 14,226 potential recipients. This list was then re-verified resulting in the removal of a further 1,305 records, giving a total of 12,924.

Following testing for the validity of email addresses we reached a total of 9,752 likely valid addresses, which was taken as the basic sample. Manual verification and follow-up of the non-valid email addresses enabled this number to be brought back up to 11,131 potential respondents. The number of usable responses received is 2,242, giving a gross response rate of 20.1%. This is higher when the active refusals and the invalid addresses are considered.

Survey results show that 82% (n=1775) of respondents participated in at least one Integrated Project, and 34% (n=594) participated in at least one Network of Excellence - it being possible to have participated in both.

The majority of respondents came from Germany (15%), Italy, the United Kingdom (11%) and France (9%). Nine out of the top ten respondent countries came from the EU15. In total, 77% of respondents were from EU15 countries, 9% from EU12 countries, and 13% from other countries. 68 countries registered at least one response to our survey.

Most respondents could be categorised as Higher Education Institutions or Public Research Organisations, and 53% considered themselves to be a leading player in their domain.
The questionnaire sought to gather more general business and participation data from all respondents. Respondents were asked to characterise the nature of their participation in FP6. Many (85%) termed the commercial risk of their participation as low/medium-low and 75% felt that there was little risk of failure. Importantly, 85% considered that the participation was of high/medium-high strategic importance and over 70% believed their participation was important for society.

When we look at these responses with respect to organisational type, we see that in most cases each grouping shares the same attitudes to each of the following categorisations. Higher Education Institutions and Public Research Organisations do however perceive there to be a lower technical risk to their participations when compared with industrial respondents.

Figure 5 Please characterise the nature of your organisation’s overall participation in FP6 (n=1508)

Seventy three percent of respondents highlighted that their participation was within a core/very core area of research for their organisation, and 46% considered their FP6 research to be characterised as applied research. A greater proportion of industry respondents felt that their research could be considered applied, where as non-industry respondents leaned more towards...
basic / borderline basic. Finally, 96% believed that their participation was part of mid-to-long term development activities within their organisation.

Most participants had previously taken part in Framework Programmes, as well as other research programmes, and were also participating in FP7.

Figure 6 Has your organisation taken part in other projects under other Research Programmes?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP7</td>
<td>68.8%</td>
<td>1034</td>
</tr>
<tr>
<td>FP5</td>
<td>76.2%</td>
<td>1146</td>
</tr>
<tr>
<td>FP4</td>
<td>52.7%</td>
<td>792</td>
</tr>
<tr>
<td>Other international research programmes</td>
<td>68.2%</td>
<td>1025</td>
</tr>
<tr>
<td>National research programmes</td>
<td>86.6%</td>
<td>1302</td>
</tr>
<tr>
<td>Regional research programmes</td>
<td>59.1%</td>
<td>889</td>
</tr>
</tbody>
</table>

The overall survey analysis is attached in annex to the report, and the detailed analysis is to be found in the chapter on each of the instruments.

4.3 Interview programme

A number of initial interviews were carried out with key persons in the European Commission, mainly to identify key issues to be covered in the survey, especially any know issues or specific issues in the various domains.

The initial interviews highlighted the differences between both the Thematic Priorities and the instruments. This is particularly important since it affected the way in which the questionnaire was constructed since there are difference ways of demonstrating “success” and “impact” in different areas. The nature of the research undertaken and the types of partner also have an effect on this – for example in the definition of optimal project sizes or in how the durability or integration of networks can be illustrated. In the case of IPs the nature of the research results, while broadly falling much more within the traditional categories, and indeed the nature of the integration of the projects, also varies between research areas. For example, where there are high numbers of industrial partners the degree of integration and potential competition issues might limit resource sharing, although the project might still show a major advance on previous behaviour.

In addition a series of telephone interviews was conducted with national NCPs and NCP Coordinators from various EU15 and New Member State countries. These interviews provided detailed information of the special issues arisen in the member states regarding the introduction of the new instruments. These interviews revealed the variability of the effects, appropriateness and effectiveness of the instruments from different national views.

4.4 Case studies

The case studies formed an important element of the study and were used to test some of the initial hypotheses of the study.

Case studies were chosen based ability to contribute to the analysis of the instruments and were selected on the basis of having information to contribute. This means they were not good practice examples, but covered a range of experiences. The selection of projects also took into account the different participation patterns across the various programme areas, including a range of sizes of project and of participant (for example the aim was to include at least one of the SME IPs) and start dates (to take into account the corrective measures and the maturity of the instrument). The number of case studies means that there can be no question of selecting a “representative” sample but the range was illustrative of the key areas of programme coverage.

Based on the composition analysis carried out in phase 1, a selection of case study projects consisting of 20 IPs and 10 NoEs was made. The balance between the instruments differed
from the original plan but was made at the request of the steering group taking into account the balance of the funding between the instruments and the fact that the NoEs had already been the subject of the high-level expert group investigation.

Each case study was informed by qualitative interviews with at least 3 participants including the coordinator. Where there were more than 20 participants 4-5 interviews were performed, and it was ensured that these covered a range of participants from the different sectors involved, and those occupying a range of roles within the consortia. In this way, the case studies intended to gain a range of perspectives reflecting different viewpoints on each project.

The purpose of the case studies was to explore the main issues associated with the new instruments and examine in more depth the points arising from the survey. The case studies aimed to gain an overview of the perspectives of participants with regards to the novel aspects of the new instruments in comparison with the previous generation of programmes. This included the interpretations of the term “critical mass”, and the relevance to the general focus on structuring the European Research Area.

Questions asked in the interviews related to the origins of the project: the identified need for the project/network, how members were brought together, and the main reasons that members chose to join the project/network. Interviewees were asked to describe the integration and communication activities, the results and follow-on activities resulting form the project/network. Interviewees were asked to give their views on the role, optimum size, and duration of the project/network.

5 Analysis of FP6 database

The analysis was carried out on the entire FP6 database, containing all of the contracted projects, to examine participation patterns and comparisons of old and new instruments. In this case are only looking at the Integrated Projects and the Networks of Excellence. The other new instruments such as Article 169 and the Integrated Infrastructure Initiatives are not within the scope of this study, and in any case were only implemented in extremely small numbers making any statistical analysis impossible.

The statistics were analysed on the basis of the projects, and on the participations (one institution may have participated in several projects.

The pattern of distribution among the approved projects is as follows:

Figure 7 Distribution of projects by instrument\(^8\) and priority

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Instrument</th>
<th>CA</th>
<th>CLR</th>
<th>CRAFT</th>
<th>I3</th>
<th>IP</th>
<th>NOE</th>
<th>SSA</th>
<th>STREP</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Life sciences, genomics and biotechnology for health</td>
<td>24</td>
<td>121</td>
<td>38</td>
<td>103</td>
<td>313</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Information society technologies</td>
<td>59</td>
<td>231</td>
<td>59</td>
<td>151</td>
<td>590</td>
<td>1090</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices</td>
<td>17</td>
<td>97</td>
<td>22</td>
<td>57</td>
<td>252</td>
<td>445</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Aeronautics and space</td>
<td>9</td>
<td>38</td>
<td>3</td>
<td>41</td>
<td>150</td>
<td>241</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Food quality and safety</td>
<td>7</td>
<td>31</td>
<td>12</td>
<td>75</td>
<td>60</td>
<td>185</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sustainable development, global change and ecosystems</td>
<td>68</td>
<td>150</td>
<td>19</td>
<td>142</td>
<td>285</td>
<td>664</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Citizens and governance in a knowledge-based</td>
<td>15</td>
<td>20</td>
<td>14</td>
<td>17</td>
<td>80</td>
<td>146</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^8\) The Marie Curie mobility actions are not included in the tables as they skew the analysis.
In addition to the IPs and NoEs to be found in the 7 Integrating Research thematic priorities, there is a small selection of projects in other areas – Euratom, policy support, research infrastructures and International cooperation.

The average size (by number of partners) varies – IPs range from 1 to 75 participants with a mean size of 25, and NoEs from 9 to 116, with a mean size of 30. In comparison with the traditional instruments, especially STREPs, this represents a significant increase in scale. The distribution in size (number of partners) of the main instruments is as shown below:

Figure 8 Comparative size of instruments (by number of partners)

The pattern does vary across the thematic priorities; with the Networks in IST, Sustainable development and Euratom having a much larger mean number of partners than nanotechnologies or aeronautics and space. On average the IPs in food quality and safety were the largest while both types of project had a lower mean number of partners in the area of citizens and governance.
Figure 9  Average size of projects by priority

This pattern is reflected also in the distribution when analysed by project.

In summary then, comparison of the two new instruments with the traditional STREP gives the following result.
The effectiveness, implementation and impacts of new instruments introduced in FP6

Figure 11 Summary of key FP6 data by instrument type

<table>
<thead>
<tr>
<th>Instrument type</th>
<th>Total financial allocation (M€)</th>
<th>Total number of Projects</th>
<th>Average EU contribution per Project (M€)</th>
<th>Average number of participants</th>
<th>Average EU contribution per participant (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated projects</td>
<td>6,657</td>
<td>703</td>
<td>9.44</td>
<td>25</td>
<td>305,288</td>
</tr>
<tr>
<td>Network of Excellence</td>
<td>1,262</td>
<td>171</td>
<td>7.34</td>
<td>30</td>
<td>244,909</td>
</tr>
<tr>
<td>Strategic Research Projects</td>
<td>4,485</td>
<td>2279</td>
<td>1.97</td>
<td>9</td>
<td>209,093</td>
</tr>
</tbody>
</table>

In addition to the above comparison of the FP6 instruments the following table provides an overview on the FP5 projects by various instrument types, while Figure 13 makes indication on the organisation’s activity type in the Fifth Framework Programme.

Figure 12 Summary of key FP5 data by action type

<table>
<thead>
<tr>
<th>Action type</th>
<th>Total financial allocation (M€)</th>
<th>Total number of Projects</th>
<th>Number of Participations</th>
<th>Average EU contribution per Project (M€)</th>
<th>Average number of participants</th>
<th>Average EU contribution per participant (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accompanying measures</td>
<td>1,103</td>
<td>3,089</td>
<td>9,537</td>
<td>0.36</td>
<td>3</td>
<td>115,655</td>
</tr>
<tr>
<td>Concerted actions</td>
<td>126</td>
<td>208</td>
<td>2,542</td>
<td>0.61</td>
<td>12</td>
<td>49,567</td>
</tr>
<tr>
<td>Fellowships</td>
<td>536</td>
<td>3,904</td>
<td>3,928</td>
<td>0.14</td>
<td>1</td>
<td>136,456</td>
</tr>
<tr>
<td>Shared-cost actions</td>
<td>10,357</td>
<td>8,433</td>
<td>56,217</td>
<td>1.23</td>
<td>7</td>
<td>184,233</td>
</tr>
<tr>
<td>Support to networks</td>
<td>944</td>
<td>919</td>
<td>12,043</td>
<td>1.03</td>
<td>13</td>
<td>78,386</td>
</tr>
<tr>
<td>Total</td>
<td>13,065</td>
<td>16,553</td>
<td>84,267</td>
<td>0.79</td>
<td>5</td>
<td>155,043</td>
</tr>
</tbody>
</table>

This shows that the average size of the projects supported under FP6 as a whole was greater than under FP5 – the average size of the shared cost projects rose from 7 participants for shared cost actions over all in FP5 to 9 for the STREPs alone in FP6 or from 5.1 to 7.4 for the programme as a whole\(^9\), and an increase of approximately 13.5% in the funding per partner. There was, however, a major reduction in the number of projects and reduction of 10,000 in the number of participants.

Figure 13 Overview on participations in FP5 by organisation type

<table>
<thead>
<tr>
<th>Action type</th>
<th>Total financial allocation (M€)</th>
<th>Number of projects involving the organisation type</th>
<th>Number of Participations</th>
<th>Average EU contribution per participant (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Education Sector</td>
<td>4,163</td>
<td>9,807</td>
<td>25,867</td>
<td>160,939</td>
</tr>
<tr>
<td>Industry</td>
<td>1,288</td>
<td>3,794</td>
<td>8,808</td>
<td>146,231</td>
</tr>
<tr>
<td>Research Centres</td>
<td>3,958</td>
<td>9,607</td>
<td>24,023</td>
<td>164,759</td>
</tr>
<tr>
<td>Others</td>
<td>3,521</td>
<td>8,085</td>
<td>24,918</td>
<td>141,303</td>
</tr>
<tr>
<td>Not Defined</td>
<td>67</td>
<td>487</td>
<td>651</td>
<td>102,919</td>
</tr>
</tbody>
</table>

The participation by different types of organisation also varies across the instruments, with the level of industrial participation much lower in the NoEs than in the IPs. This is not a surprise, but it is important because of the implications it has for the potential effectiveness and impact of the instruments. 15% of companies that reported themselves as SMEs participate in IPs while the share is only 5% in case of NoEs. However, it has to be noted that the category SME is a subset of industry and the accuracy of the SME flag has to be tested. The table below represents the various percentages of participation of the distinct organisation types in Integrated Projects and Networks of Excellence for the EU15 countries and for the New Member States measured up to overall participations.

The decline in the overall level of industrial participation from FP5 raised concerns in the FP6 evaluations, but it does reflect a continuing trend.

Figure 14 Participation in IPs and NoEs as proportion of overall participations in FP6

<table>
<thead>
<tr>
<th></th>
<th>HES</th>
<th>IND</th>
<th>REC</th>
<th>N/A</th>
<th>Other 10</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IPs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15</td>
<td>25%</td>
<td>24%</td>
<td>20%</td>
<td>1%</td>
<td>13%</td>
<td>83%</td>
</tr>
<tr>
<td>NMS</td>
<td>2%</td>
<td>1%</td>
<td>2%</td>
<td>0%</td>
<td>1%</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>31%</td>
<td>27%</td>
<td>26%</td>
<td>1%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>NoEs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15</td>
<td>46%</td>
<td>7%</td>
<td>23%</td>
<td>0%</td>
<td>6%</td>
<td>83%</td>
</tr>
<tr>
<td>NMS</td>
<td>4%</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>Total</td>
<td>56%</td>
<td>8%</td>
<td>29%</td>
<td>0%</td>
<td>7%</td>
<td>100%</td>
</tr>
</tbody>
</table>

10 Includes foundations, NGOs and public authorities

This overall pattern is consistent across the different thematic priorities, however, the degree of difference is also quite marked – participation from higher education institutions in NoEs varies from 29% in Aeronautics and Space and Euratom to 70% in Citizens and governance in a knowledge-based society. Industry participation ranges from none (Citizens and governance) or 3% in food quality and safety to 16% for Euratom and 11% in sustainable development. In the case of IPs the participation from higher education ranges from 17% (aeronautics and Space) to 69% in Citizens and governance, while industry ranges from 1% (Citizens and governance) to 48% in Nanotechnologies and nanosciences. Again this does not bring any major surprises but illustrates the differences between the industry and research landscapes in the different priority areas. The pattern of SME participation also was raised as a cause for concern – however, this seems overall to follow the general participation rate of industry – again with differences between the priorities.

Geographical distribution of participation is also varied. The New Member States were raised as a particular cause for concern. In some thematic priorities this lower level of participation is more marked than others – in some cases reflecting the strength or otherwise of research in that area but in other cases the explanation is less obvious. There was also a question raised about the participation of smaller countries in general in the new instruments.

At this stage, to differentiate between the issues of overall participation and the new instruments themselves, we have calculated the proportion of IPs and NoEs as a proportion of the overall participation of the country. Here it can be seen that there is a noticeable difference between the EU15 and the NMS – the highest level in the NMS (Czech Republic and Poland) still falls some way short of the lowest level in the EU 15 (Ireland). This is of course, on top of the fact that the overall level of participation itself is lower than for EU15, which suggests that the instruments themselves have an effect on the participation rates.
Focusing on the coordinator role of the Integrated Projects and in the Networks of Excellence led by an organisation from a EU country the significance of the EU15 is evident. There are hardly any NMS that led IPs or NoEs.
Three Integrated Projects led by a coordinator from a New Member State covered the following thematic areas: Aeronautics and space, IST, Citizens and governance in a knowledge-based society. The successful NoEs, led by Polish coordinators, were from Nanotechnologies and Nanosciences and from the Food Quality and Safety priority areas.

Distribution of the different instruments shows an equal allocation across the life of the programme for IPs and STREPs, however with regards to Networks of Excellence there is a continuous decrease from the launch of FP6 till the last calls in 2005. There were no calls for proposals for the three instruments in 2006. The following two charts summarize the number of projects, number of participants and EC contribution allocated by instrument type based on the calls for proposals for each year.

The Marimon report recommended a rebalancing between the IPs and STREPs to increase the opportunities for smaller and more flexible projects. It can be seen that there was a slight
increase in the STREPs funding and participation and a slight decrease for the IPs over the period.

Figure 18 Distribution of projects, number of participants and EC funding: NoE

While comparison of STREPs and IPs in Figure 17 shows only slight differences in the allocation of the projects throughout the 6th Framework Programme the chart above shows a clear decline in the number of NoEs in line with strong decrease in the number of participants and the EC funding allocated.
6 Integrated projects

The chapter is built up around the key attributes of the Integrated Projects. Each subsection comprises a qualitative description followed by the analysis of the participants’ survey results and findings from the interviews and case studies. Through the integration of the different data sources, approaches more robust and reliable overview can be achieved on the efficiency of the new instruments.

6.1 Purpose of the Integrated Projects

Integrated Projects are collaborative research projects, which are aimed at knowledge generation in various thematic areas of the Sixth Framework Programme. They are specifically focusing on the improvement of Europe's competitiveness while "addressing major needs in society". Integrated Projects are ambitious research projects using “programme approach” and numerous components including a broad range from basic to applied research activities.

Integrated Projects were expected to bring together researchers from different scientific field in order to obtain critical mass of activities, expertise and resources to be able to achieve the ambitious objectives of these collaborative projects.

6.2 Project participants

According to the rules of participation any legal entity could participate in an Integrated Project. However, in practice, the main participants in Integrated Projects were organisations active in the research field: enterprises (SMEs were strongly encouraged to participate) research institutes and universities. The analysis of the FP6 database revealed that IP project participants consist mostly of higher education institutes representing 31% of the overall number, followed by industrial partners with 27% and research institutes with 26%. Organisations with skills in management, dissemination and knowledge transfer, as well as potential users and other stakeholders, could also participate. Integrated Projects require throughout management and coordination due to the large number of participants in the consortia.

The participants’ survey captured responses from various types of organisation as represented in Figure 19.

Figure 19 Organisation type (n=1225)
Most of the respondents involved in Integrated Projects (IPs) were either Higher Education Institutes or Public Research Organisations, while 30% of participants were either large or small enterprises.

Participation of the respondents fell under three main thematic priorities, as shown in Figure 20. Despite the high number of responses in IST, the area is still slightly under-represented compared to the overall project distribution. Other thematic priorities are broadly in line with the overall pattern of participation.

**Figure 20** Distribution of IP respondents by Thematic Priority

<table>
<thead>
<tr>
<th>Thematic Priorities</th>
<th>Response Percent</th>
<th>Response count</th>
<th>Distribution of IPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Society Technologies</td>
<td>27.2%</td>
<td>363</td>
<td>33%</td>
</tr>
<tr>
<td>Sustainable development, global change and eco-systems</td>
<td>25.7%</td>
<td>343</td>
<td>22%</td>
</tr>
<tr>
<td>Life sciences, genomics and biotechnology for health</td>
<td>21.3%</td>
<td>285</td>
<td>17%</td>
</tr>
<tr>
<td>Nanotechnologies and nanosciences, knowledge-based multi-functional materials and new production processes and devices</td>
<td>16.8%</td>
<td>224</td>
<td>14%</td>
</tr>
<tr>
<td>Food quality and safety</td>
<td>9.6%</td>
<td>128</td>
<td>4%</td>
</tr>
<tr>
<td>Aeronautics</td>
<td>5.6%</td>
<td>75</td>
<td>9%</td>
</tr>
<tr>
<td>Space</td>
<td>2.2%</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Citizens and governance in a knowledge-based society</td>
<td>3.6%</td>
<td>48</td>
<td>3%</td>
</tr>
</tbody>
</table>

In order to get a better understanding of participations respondents were asked in the survey to outline their level of participation. Expectedly, a large proportion of respondents participated only in one IP as a participant rather than a coordinator. On the other end of the list there are 33 respondents, who were involved in five or more Integrated Projects during the Sixth Framework Programme. Almost 50% of these respondents fell under the category “Large industry/business organisation” while 33% were “Public Research Organisations”. There are 13 IP projects led by an SME coordinator covering four thematic priorities: IST (5 projects), Nanotechnologies (4 projects), Life sciences (2 projects) and Sustainable development (2 projects). Coordinators represent predominantly the EU15 countries.

**Figure 21** In how many IPs did you participate?

<table>
<thead>
<tr>
<th>Only one</th>
<th>Coordinator (%)</th>
<th>Participant (%)</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14%</td>
<td>88%</td>
<td>957</td>
</tr>
<tr>
<td>2 to 4</td>
<td>8%</td>
<td>95%</td>
<td>414</td>
</tr>
<tr>
<td>5 or more</td>
<td>18%</td>
<td>91%</td>
<td>33</td>
</tr>
</tbody>
</table>

In addition to the diversity of the participating organisations in the various projects, the size of the consortia is one of the most defining attributes of the IPs. The size and interpretation of “critical mass” have been identified as a contentious issue in previous studies. It was not surprising to find that 61% of respondents of the survey felt that there were too many partners in their project with only 38% feeling the size was about right and less than 1% regarding their project as too small. It was more often the case that EU15 countries felt that there were too many partners.

The “optimum size” of the partnership for maximum efficiency seems to be 10-20 participants. However, it must be pointed out that this figure can be different from one thematic priority to another. The survey found that 22 per cent (n=274) of respondents felt that the optimum number of participants for an IP was 10, 16% considering 15 and 14% believing 20 were more appropriate to an effective collaboration.
The interviews carried out with EC staff and National Contact Points also highlighted the importance of the size of the consortia of the Integrated Projects especially in comparison to STREPs. Some of the NCPs experienced confusion among the proposers regarding the differentiation of the two instruments. Common misunderstanding was that the applicants regarded the new Integrated Projects as larger version of the STREPs without making any distinction in the objectives or aims of the instruments. As the composition analysis revealed the New Member States and the smaller countries had hardly any leading role in the projects. Their contribution is slightly marginal in the huge consortia; however, the NCPs of the NMS rated any kind of participation valuable in IPs. Researchers were able to get “into the game” and in addition views reflected that most of the time future participation in the FPs might be dependent on the successful realisation of the opportunity offered through the involvement in these IPs.

Twenty case studies have been carried on the Integrated Projects. Regarding the size of the projects the following findings should be highlighted. The majority of Integrated Projects were large consortia many included up to 20 to 35 partners. Most projects ended up with more partners than had been proposed at the beginning. In some cases this was due to a need to fulfil Commission objectives of including certain partners such as members from CEE states, SMEs. The opinions on the large number of partners ranged from seeing it as a huge benefit to considering it a direct disadvantage. Although most participants could see the benefits of the large scale project, most discussed a need for balance between the benefits of bringing together a large group, and the difficulty of coordinating and organising a large consortium, the term “unwieldy” was mentioned by several partners. Coordinating large groups sometimes made progress slow. Recommendations on the number of partners varied. Some felt the consortium they were in could be halved, some suggested between 5-15 partners. It was found in some cases that it was difficult for SMEs to get involved in the project due to the large size.

The benefits of bringing together a large group were more significant for some projects than others. Where a research area was previously fragmented, consisting of many sectors and areas of expertise or where project objectives included tangible outputs, for example development of technologies resulting in new machines/equipment; the advantage of bringing a significant group of stakeholders together was evident. The CO2REMOVE project was instrumental in facilitating research that was only possible through the coordination of many stakeholders. Sharing data from geological demonstration sites, and the opportunity to carry out standardised research enabled the development of common monitoring methodologies essential for this area of research.

Projects that had more difficulty enabling integration, and that did not appear to benefit as much from greater size were those with more theoretical objectives, particularly in the social sciences, or where partners are in direct competition, for example drug development in the life sciences. The respondents interviewed that felt the projects had become too large suggested that smaller programmes with more focussed objectives are more efficient. One interviewee commented that only mainstream work was funded in the integrated projects, and that there is less risk-taking when funding large international projects. Proposals for smaller projects were awarded in later rounds suggesting the focus shifted somewhat from aiming for large projects as the main goal, to aiming for closer integration of a smaller group of partners.

In the majority of cases partners were brought together through existing networks, often led by the coordinator, or a core group of partners involved in the proposal process. It was considered an advantage in some cases to use partners with existing relations. For one project, two expressions of interest had been published and the lead groups decided to combine their efforts. This resulted in a particularly large consortium, with the advantage that it brought about new relationships. In one case many groups expressed an interest in joining the project, and the coordinators held a meeting for each group to give a 3-minute presentation, and around 20 members were added to the project from 80 groups applying.
6.3 Activities covered by EU Contribution

The Classification of the FP 6 Instruments contains the following detailed description on the activities that can be included into the Integrated Projects:\footnote{Source: European Commission: Classification of the FP Instruments; October 2004}:

- "**RTD activities:** all activities directly aimed at creating new knowledge form the core of the Integrated Project; this may include innovation-related activities, such as:
  - Activities relating to the protection and dissemination of knowledge and, when relevant, studies on the wider societal impact of that knowledge,
  - Activities to promote the exploitation of the results and
  - "Take-up" actions.

  These actions are inter-related and should be conceived and implemented in a coherent way (intellectual property protection, dissemination activities, studies of socio-economic aspects, activities promoting the exploitation of results)

- **Demonstration activities:** activities to prove the viability of new technologies that offer a potential economic advantage but which cannot be commercialised directly (e.g. testing of prototypes)

- **Training activities:** advanced training for researchers and other key staff, research managers, industrial executives (in particular for SMEs), and potential users of the knowledge produced within the project. These activities should contribute to the professional development of the persons concerned.

- **Consortium management activities**

On the practical side, interviews with the project participant revealed that all integrated projects were organised into work packages, usually 5 or 6 work packages. These includes 3-4 technical subprojects with several project members assigned to them, and 2-3 supporting projects including activities such as dissemination, coordination, and supplementary research. The majority of projects also had crosscutting work packages, or transversal groups to bridge the work of the main work packages and aid cohesion of the overall project. In some cases work packages were further cut down into tasks performed by 1-3 members.

Projects were managed in a hierarchical structure with the coordinator leading a steering group of partners, and work package leaders directing the work packages according to decisions of the steering group. Work package leaders were responsible for reporting, and timely delivery of project outputs, and coordination with the other work packages. Members often reported their own work that fed into the work package leaders’ report that would be presented at the general assembly.

In a number of cases participants felt that the work packages acted almost as individual projects, and only the coordinator and steering group would see the overall picture. In this way the project itself behaved more as an umbrella structure for sub-projects. Some project members were more active than others. Some partners became involved in 2-3 work packages, while others performed a particular task lasting only a few months on their own. However, the majority of partners worked with a number of other research groups during the project.

Communication activities create a vital part of the Integrated Projects. The direction of these activities is two fold: due to the size of the consortia large emphasis has to be put on the internal communication processes in order to obtain the most efficient collaboration and cooperation among the project partners. However, the communication activities towards the public also constitute essential part of the projects.
Based on the case studies it was found that each project undertook a similar set of communication activities. With yearly whole consortia meetings, work package meetings every 3-6 months, as well as regular telephone conferences, and use of electronic forms of communication. Some projects used the website for reporting purposes which was found to be useful for partners to follow each other’s work. Some projects developed a “wiki” on their website for accumulation and dissemination of practical knowledge both within the project and to the scientific community. One project developed a short promotional video available on the website.

Projects put differing emphasis on dissemination as an objective. All projects published papers in peer reviewed academic journals, and produced project reports available on the websites. Entirely academic consortia consolidated the results into a single published volume at the end. Participants from most projects attended scientific conferences to present their findings and promote the results of the project. Some projects established summer schools to train postgraduate students, usually with an emphasis on interdisciplinarity to generate understanding between the disciplines working together on the project. In many cases there was exchange of staff, particularly doctoral students. Often materials and samples were exchanged for series of test, and in this case doctoral students would follow their compound/sample. This enabled the exchange and comparison of research techniques and methodologies, in some cases it was found that subtle differences in methodologies were seen in separate groups’ results, and in some cases standardised methodologies were developed.

One project found it necessary to produce a glossary of terms to enable communication between disciplines, and agree a common language to work with. Those with the most efforts for dissemination were often projects with more tangible outputs, such as potential commercial products.

6.4 Funding mechanism and duration of the support

The average duration of an Integrated Project varied from 36 to 60 months depending on the thematic priority. A duration exceeding 60 months could in principle be accepted if this was necessary to achieve the objectives of the project, but we have no examples of this.

With the agreement of the Commission, the consortium may decide to add new participants as the project evolves, though without additional financing from the EU. The contract will specify under what circumstances the addition of a new participant will require the prior publication of a competitive call. Participants in an Integrated Project could “reserve” a share of their initial budget to be dedicated to further partners expected to join the partnership at a later stage.

It is important note that the principle of the collective responsibility, which declares collective financial responsibility for the partners who carry out a joint project was in force in the Sixth Framework Programme. Interviewees reported this requirement as one of the most burdensome and hindering factor for the huge IP consortia established.

Based on the survey results, the optimum duration of IPs reported by the project participants seems to be a split between 48 months (38%) and 36 months (31%) while interviewees gave more varying opinions as to the suitability of the duration of projects. Some interviewees felt this was too long, and that shorter, smaller projects with greater focus would invite greater competition and therefore quality in research. Other interviewees felt that projects should be up to 6-10 years, many saying 5 years should be minimum to allow for development of students and young researchers, and ensure continuation of work through changes of staff. At least one project applied for a 6-month extension to consolidate the results. In some cases the lack of continuation following a project, where a large consortium was successfully brought together as an integrated group, to then revert to working in small projects in competition with each other, was thought to contradict the efforts that had been made and resources that had been dedicated, to building a networked consortium accustomed to collaborating together.

The funding for the Integrated Projects took the form of a grant to the budget. The funding comprised a percentage funding of the total cost of the proposed project based on the chosen cost reporting method, on the types of activities carried out (see Chapter 6.3 Activities covered
The effectiveness, implementation and impacts of new instruments introduced in FP6 by EU Contribution, on the maximum reimbursement rates defined by the financial rules of participation and on any other specific provisions linked to the instrument.

Integrated Projects were intended to be ambitious, large scale operations, and had suitably significant funds allocated to attract large consortia with ambitious projects in mind. Projects received from around €5 million up to around €23 million. In the majority of cases funding from the Commission represented about 70% of total project cost. According to the survey findings, the majority of respondents (22%) saw €10m as the optimum funding level for an IP.

For academic partners the projects were an opportunity to fund work linked to their area of research. Industrial partners contributed matched funding to the project. This enabled industrial partners to obtain some shared risk to perform research in little-defined emerging technologies, such as Extreme Ultraviolet Lithography (EUVL), or in less lucrative markets, such as pharmaceutical development for diseases predominantly of less developed countries.

The partners interviewed seemed satisfied with the level of funding. However, many projects experienced delays in receiving funds. This was a commonly cited difficulty, particularly for SMEs, that pre-funding work was a significant drawback of involvement in the project. One coordinator commented that the proportion of the budget dedicated to dissemination was disproportionately large, and that scarce funds for R&D should not be sidetracked for publicity activities, although this is necessary to some extent.

6.5 Motivations, objectives for participation vs. expectations met

Amongst the most important reasons for choosing the IP research instrument, 69% of the survey respondents considered that its ability to build critical mass in terms of project scale/duration as important or very important. Similarly, 72% of respondents felt the same with regards to the ability of IPs to build critical mass in terms of sector involvement. The least important reason selected by respondents related to administrative simplification and reduction in management overhead.

Figure 22 Reasons for selecting the instrument over traditional STREPs (n=1272)

In terms of the extent to which these expectations were met, those relating to critical mass and overall budgets were mainly achieved, but those regarding increased funding for participants and simplification and flexibility were clearly not.
The important objectives for participation in this type of project included being able to work with researchers from other disciplines, new and improved networks and presence in the international research arena, or to develop new or improved methods, tools, techniques, processes. There is a noticeable step down in importance for the final six motives as can be seen in Figure 24.

When looking specifically at motives to do with access to capabilities and facilities in respondents’ countries, responses from New Members States differed significantly from respondents from EU15 and other countries.

<table>
<thead>
<tr>
<th>Motive</th>
<th>NMS</th>
<th>EU15</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to capabilities that do not exist in your country</td>
<td>81%</td>
<td>47.2%</td>
<td>43%</td>
</tr>
<tr>
<td>Access to facilities that do not exist in your country</td>
<td>63%</td>
<td>40.5%</td>
<td>48.8%</td>
</tr>
</tbody>
</table>
The case studies revealed that all of the organisations joined the projects they were interested in because they were performing research in a relevant field and were attracted by the ambitious objectives of the projects. Alongside the advantage of funds, and shared risk in ventures, most organisations were keen to network with others. Many found this was the most prominent project taking place in their area of research, and often the integrated projects were the only opportunity for key players from across Europe to collaborate. For academic partners this brought many into contact with other leading institutions. For industrial partners it brought them closer to the state-of-the-art research performed by academic partners, and gave opportunities to develop products with knowledge gained from other institutions. This was particularly important for SME members. For members for newly acceded countries joining an integrated project presented an opportunity to meet new European partners, and also to learn more about the European Union and joint project research processes. In some cases access to wider sources of data was important to partners.

6.6 Results from the Integrated Projects

The importance of potential tangible outputs from IPs is listed in Figure 26. The two highest-ranking outputs related to publications and new or improved methods, techniques, processes. Understandably, Universities and Public Research organisations featured most strongly in the importance of publications – 80% and 69% respectively rating it very important.

By some margin, the least important output for respondents was the setup of a new company. There was a common dismissal of the importance of this output across all respondent groupings.

Figure 26 Important outputs from IPs (n=1293)

Respondents were then asked about the importance of potential intangible outputs. New knowledge and relationships were considered to be most important, closely followed by new international perspectives. New commercial / market knowledge was the least important to respondents.

As before, new scientific and technical knowledge was of greater importance to Higher Education Institutions and Public Research Organisations than to industry members. SMEs placed the highest importance on new commercial / market knowledge.
Overall there was a positive reaction to IPs regarding unexpected benefits. 67% of respondents felt that they had experienced either major or minor positive benefits from participation in IPs (more than one answer possible). However, this still leaves a large number of respondents who had unexpected negative benefits.

Figure 28 Unexpected outcomes of IPs (n=1013)

The case studies found that most of the integrated projects achieved interesting results in line with the project objectives. Some particularly notable achievements occurred in projects scoping novel technologies, or bringing together a new consortium.

Tangible outputs included:

- academic publications
- patents
- development of novel technologies and methodologies
- vaccine targets
- information systems
- search engines
- software
The effectiveness, implementation and impacts of new instruments introduced in FP6

- demonstration prototypes / machinery
- commercial products
- dissemination of products and processes to end users

A group of members from most of the projects have started a follow-on project that builds on the results of the integrated project, and projects that are still going have similar plans to do this. Most participants felt they had found new collaborating partners that they would not have come across in a smaller consortium, others had strengthened existing relations with collaborators. The natural evolution of the large consortiums seems to have separated, however, into smaller ongoing projects. However, members from some projects, notably the TRIOH project, were disappointed that there was no support for continuation of the consortium as a whole.

6.7 Overall view on the Integrated Projects

Integrated Projects are based on a “programme approach” dealing with different issues. They are usually composed of various “modules” covering research, demonstration, training, and management of the consortium. Although this was not an obligation, the ambitious nature of Integrated Projects often required them to be multidisciplinary.

In comparison with previous programmes, only a small number of respondents felt that the level of bureaucracy and the time needed to manage the programme had decreased, and more than half felt that they were higher. Half of the respondents felt IP issues were more complex than before. About 40% felt flexibility, both in content and consortium, had increased. Risk, both scientific and financial was reported as unchanged by half the respondents, 25% reporting an increase, and a similar proportion reporting a decrease.

Following this, the survey then asked respondents to indicate what they perceived the maximum size of IPs should be with regards to partnership and funding. 21% (n=240) felt this maximum should be set at 20 participant and 18% of respondents said that the maximum level of funding should be €10m. 14% thought it should be double this at €20m.

Respondents were asked to differentiate IPs from traditional shared cost research projects. There was felt to be much higher bureaucracy and management time required for IPs, 25% and 22% respectively. It was also identified that flexibility was lower or much lower in IPs. These feelings were shared across the respondent groupings.

Figure 29 Views of IPs compared to FP5 instruments (n=1119)

The results of the survey of participants’ opinions on integrated projects overall indicated that novel working relationships were formed, and that integration, in terms of collaboration with research groups in a wide variety of fields had occurred. In total, 88% of respondents either
agreed or strongly agreed that as a result of their involvement in the project they had formed new relationships with new partners. As a result of these new relationships, 86% of respondents either agreed or strongly agreed that they believed they would continue to collaborate with members of the consortium on new activities. In terms of their experience working within the integrated projects 85% of respondents strongly agreed or agreed, that they had worked closely with other partners. Although the respondents seem to agree that integration was achieved, it seems not all partners were equally involved in the projects. Only, 57% of participants agreed or strongly agreed that most partners were involved across the range of activities. In addition, only 46% of participants felt that SMEs played an active role across the activities of the project. Where SMEs were involved, it seemed that they often provided specialist services to one aspect of the project. 54% of respondents agreed or strongly agreed that the project provided opportunities for researchers to move between organisations for periods of research. Figure 30 represents the overall views on the collaborative aspects of the integrated projects.

![Collaboration in the Integrated Projects](image)

It is notable that the top three rated statements about IPs convey partnership and collaboration. Regarding the scope of the activities of the IPs 84% of respondents agreed or strongly agreed that the project included a wide spectrum of research activities including more research fields, as well as basic and applied research. There was also agreement with the notion that the integration of the whole spectrum of the research activities and the research and development, application, dissemination included in the project were beneficial. the programme was merely a method to outsource aspects of the programme management. There appear to be some issues in terms of organisation of the integrated projects with 44% of respondents agreeing or strongly agreeing that the call/work programme prescribed activities for the IPs that limited the scope of the project.
Figure 31 Scale and scope of the Integrated Projects

<table>
<thead>
<tr>
<th>Scale of the IPs</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don't Know / NA</th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPs have enabled us to achieve a degree of critical mass that was impossible to attain under previous Framework Programmes</td>
<td>11%</td>
<td>19%</td>
<td>33%</td>
<td>24%</td>
<td>13%</td>
<td>1256</td>
</tr>
<tr>
<td>The scale of the project permitted more professional management of the project</td>
<td>12%</td>
<td>19%</td>
<td>36%</td>
<td>26%</td>
<td>7%</td>
<td>1257</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope of the IPs</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don't Know / NA</th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>The call/work programme prescribed activities for the IPs that limited the scope of the project</td>
<td>10%</td>
<td>37%</td>
<td>32%</td>
<td>12%</td>
<td>8%</td>
<td>1253</td>
</tr>
<tr>
<td>The level of supporting activities inside the project (communication, dissemination etc) was sufficient to enable close working between the partners</td>
<td>6%</td>
<td>20%</td>
<td>47%</td>
<td>25%</td>
<td>2%</td>
<td>1259</td>
</tr>
<tr>
<td>Projects included a wide spectrum of research activities in the project (more research fields, basic and applied research, )</td>
<td>2%</td>
<td>12%</td>
<td>40%</td>
<td>44%</td>
<td>2%</td>
<td>1264</td>
</tr>
<tr>
<td>The differences between IPs and the other research instruments were well explained at the time of the call.</td>
<td>6%</td>
<td>20%</td>
<td>40%</td>
<td>21%</td>
<td>13%</td>
<td>1254</td>
</tr>
<tr>
<td>Having the research, development, application, dissemination, etc activities integrated in one project was a benefit</td>
<td>5%</td>
<td>13%</td>
<td>37%</td>
<td>42%</td>
<td>2%</td>
<td>1277</td>
</tr>
</tbody>
</table>

Only 27% of respondents agreed or strongly agreed that IPs are just a collection of loosely related research projects with no real integration effect, which is encouraging given that a high proportion of respondent were partners in the projects rather than the co-ordinators. However, opinions were evenly divided as to whether the scale of IPs provided barriers to including new ideas and new entrants. In addition, 42% of respondents agreed or strongly agreed that the IPs are purely a method for the Framework Programme to outsource programme management, and 44% of respondents agreed or strongly agreed that the structure of IPs means that it is hard to incorporate new ideas and new entrants and a relatively large proportion, 58% of respondents felt that additional activities outside the project were necessary to ensure close collaboration between the partners.

Figure 32 summarises the survey responses regarding the organisational and structural aspects of the Integrated Projects.
Finally, respondents were invited to offer any further comments on IPs as a result of their involvement. In summary the general view of integrated projects was positive. The majority of partners was pleased with their involvement in the project, and felt the project they were involved with had been a success. Views of the respondents reflected critical importance to the role of the coordinator. Major concerns were reported mostly due to the size of the consortia and the enormous amount of management activities that were needed to achieve the most effective implementation of an Integrated Project. It was difficult to organise these projects, and on the other hand it created difficulties also for the project partners to have a good overview of the entire project and to be engaged entirely. Other complaint included that the large number of participants in the projects, although the very high amount of EC funding in total, led to a smaller share of the grant for the participants at the end. However, in some cases it was felt that with the establishment of the IPs there have been an advantage in many areas of bringing together research, and this would inform the future research of groups in smaller projects. As one of the survey respondents drew:

“IPs are the ideal instrument to form larger scale collaborations capable to address truly interdisciplinary questions from different angles”

Further comments underpinned that the participants compare the IPs to STREPs and there is still some confusion regarding the distinction of the two instruments. On the other hand some interviewees found that the Framework Programmes continue to improve over the years. The survey revealed need for continuation of the successful IPs. Respondents shared the view that they will not be able to preserve and further develop the project results only from national funding sources. Several respondents mentioned that the projects presented a useful opportunity to train doctorate and post-doctorate researchers.
7 Networks of Excellence

Chapter six follows the same structure introduced and examines the Networks of Excellence. The description incorporates the survey results, the interviews carried out with the key findings from the case studies.

7.1 Purpose of the Networks of Excellence

As defined by the European Commission:

"Networks of Excellence are designed to strengthen scientific and technological excellence on a particular research topic by integrating at a European level the critical mass of resources and expertise needed to provide European leadership and to be a world force in that topic. Networks of Excellence are therefore an instrument aimed at tackling fragmentation of existing research capacities. They should be implemented provided that:

- research capacity is fragmented in the (thematic) area being considered;
- this fragmentation prevents Europe from being competitive at international level in that area;
- the proposed integration of research capacity is likely to lead to higher scientific excellence and more efficient use of resources."

NoEs were defined to address the "fragmentation" and deficits regarding "critical mass" that were identified as major problems in research in Europe, however NoEs were not designed only to act like closed circuit projects; they have the mission to share excellence beyond the project participants.

Networks of Excellence projects were implemented across the various thematic areas of the Sixth Framework Programme aiming to shape the way of European research and to achieve durable integration as main deliverable. Although there is wide diversity of the networks, all have the common feature of dealing with fragmentation as their main objective.

The objectives of the instrument and its novel structure were reported by the interviewees as the reason for some confusion among project proposers, however, the Marimon report and additional information provided by the Commission seemed to solve uncertainty of the early days.

7.2 Project participants

Similar to the Integrated Projects, any legal entity could participate in a Network of Excellence. However, participants in the Networks mostly consisted of research centres, universities, research and technology organisations with businesses represented to the least extent.

Survey results underlined that the majority of respondents involved in Networks of Excellence (NoE) were Higher Education Institutes and Public Research Organisations. There is also a slightly different compositional balance between the main four groups of participants when compared to IPs. There is a significantly larger proportion of Higher Education Institutes and a smaller proportion of small and large business organisations.

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12 European Commission: Classification of the FP 6 Instruments, October 2004
The effectiveness, implementation and impacts of new instruments introduced in FP6

Figure 33 Organisation type

There was a 1:9 split between respondents who were NoE co-ordinators and participants and a majority of those who only participated in one network. Only 16% of respondents participated in more than one NoE, which is much less than the 32% of respondents that had participated in more than one IP.

Most respondents (70%) characterised their participation in NoEs as mainly involved with the activities of the network, with 48% of all respondents actively participating in the strategy and management of the NoE in which they were involved. Only 12% felt that they were peripherally involved in the network.

Figure 34 Participation of respondents in NoEs?

<table>
<thead>
<tr>
<th>Co-ordinator</th>
<th>Participant</th>
<th>Response count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only one</td>
<td>11%</td>
<td>91%</td>
</tr>
<tr>
<td>2 – 4</td>
<td>10%</td>
<td>90%</td>
</tr>
<tr>
<td>5 or more</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

When reviewed against the distribution of the NoEs across the Thematic Priorities, the pattern of respondents is also broadly similar. As in the case of IPs, the top three thematic priorities for NoEs were Information Society, Health, and Sustainable development.

Figure 35 Distribution of respondents by Thematic Priority

<table>
<thead>
<tr>
<th>Thematic Priority</th>
<th>Response Percent</th>
<th>Response count</th>
<th>Distribution of NoEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Society technologies</td>
<td>28.9%</td>
<td>133</td>
<td>35.33%</td>
</tr>
<tr>
<td>Life sciences, genomics and biotechnology for health</td>
<td>22.3%</td>
<td>103</td>
<td>22.75%</td>
</tr>
<tr>
<td>Sustainable development, global change and eco-systems</td>
<td>17.6%</td>
<td>81</td>
<td>11.38%</td>
</tr>
<tr>
<td>Nanotechnologies and nanosciences, knowledge-based multi-functional materials and new production processes and devices</td>
<td>16.9%</td>
<td>78</td>
<td>13.17%</td>
</tr>
<tr>
<td>Food quality and safety</td>
<td>9.8%</td>
<td>45</td>
<td>7.19%</td>
</tr>
<tr>
<td>Citizens and governance in a knowledge-based society</td>
<td>6.5%</td>
<td>30</td>
<td>8.38%</td>
</tr>
<tr>
<td>Aeronautics</td>
<td>2.6%</td>
<td>12</td>
<td>1.80%</td>
</tr>
<tr>
<td>Space</td>
<td>0.7%</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Regarding the composition of the projects the respondents claimed that all or most of the major European players in the field were represented in the networks (in 86% of cases), with only a very small number in new or emerging areas or lacking any major players.

Sixty percent of respondents reported that the NoE in which they participated has the right number of partners, and 38% felt that there was too many involved. This is similar to the reaction of those involved with IP, although a greater proportion were happier with the number of partners in NoEs. It is, however, slightly at odds with the common perception that all NoEs are too big to function satisfactorily.

As before, respondents were invited to indicate what they perceived to be the maximum parameters of a NoE should be. The results can be seen in Figure 36 below.

The projects, which were the subject of the case studies, represent the large diversity in NoEs in every respect. The number of project partners shows the huge variation with regards the Networks of Excellence instruments. Most of the consortia included partners between 20 and 50, however, there was a project that reported partners from about 100 institutions with 1,100 individuals. The FP6 database shows a broad range of NoEs regarding the number of participants, with the smallest network comprising 9 while the largest one 116 participants. Case studies revealed that the project initiators tried to achieve the broadest coverage, the most representative sample of institutions while focusing the invitations on the most excellent researchers and on keeping the number of participants within an efficiently manageable range. Another influencing factor was with regards the composition of the network the pressure from the Commission to include the partners from the New Member States. Further emphasis has been put on the engagement of SMEs.

The networks usually consist of core groups based on previous collaboration in addition to newly engaged cooperation partners. The involvement of the new partners aimed to broaden the scope of the network and to get wider coverage. The large size of the consortia indicated a strong need for coordination activities. Some case studies found that the diverse composition of the network and the huge size of the consortia, which though initially conceived as unmanageable, became a strength through good coordination.

The diversity of the networks can be emphasised through the following citations from the interviews with NoE partners:

“We wanted most countries of Europe to be represented as that gave a bigger pool to work with. The funding was then allocated according to activities rather than status or anything else.” (coordinator)

“The selection process was straight forwards because everyone knows everyone… there were no new faces” (partner)

Findings of the Expert Group on the Future of the NoEs also highlight the diverse characteristics of the instrument with regards the participating organisations:

- The large number of partners in many NoEs was a challenge, and a problem for management and organisation within institutions and it became apparent that one size does not fit all, and large partnerships only suited a small number of NoEs.
• Making transnational “virtual centres of excellence” through NoEs would involve organisational change of the existing structures. Many universities were not happy for their best departments to become members of other durable legal structures, so creating a legal structure was also a problem

• The partnerships were often uneven regarding scientific quality of the partners, and their motivation/commitment to long-term perspectives of durable integration. Often there was a “core / periphery ” problem with the core team working together, and new members left on the sidelines; where there should have been clear commonly agreed added value of the involvement of partners for the whole network, partners should share a well-defined common interest

7.3 Activities covered by EU Contribution

Activities of the networks cover three components as defined by the European Commission, which had to be submitted as “joint programme of activities”, including the following components:

• Integrating activities, which are targeted on the enhancement of the integration. These actions might comprise coordination activities, staff exchange schemes, researcher relocations, shared usage of equipments or different infrastructures, joint supervisory bodies and performance indicators implemented in addition to the investigation of the legal conditions and possibilities for durable integration

• Joint research programme, however it has to be noted that the instrument does not provide funding for research activities per se

• Activities linked to spreading of excellence comprising training programmes, dissemination activities, promotion of results in different ways

Further to the huge size of the consortia the above-described broad range of activities creates additional underlying need for a coherent management framework, which has to be taken into account when reviewing the Network activities.

Due to the special activities of the Networks, the Commission introduced indicators to measure the quality of integration achieved within the projects:

• The extent of mutual specialisation and mutual complementarity, particularly through the regular co-programming of the partners' activities, through the building up of strengths and the shrinking of weaknesses, and perhaps through the relocation of resources;

• The sharing and development for common use of research infrastructures, equipment, tools and platforms;

• The regular joint execution of research projects;

• Interactive working between the partners using electronic communication systems;

• The joint management of the knowledge portfolio;

• Joint programme of training for researchers and other key staff;

• A coherent management framework that encourages staff mobility, staff exchanges, the interoperability of data and other systems, common approaches to science and society issues and gender equality in research.13

The effectiveness, implementation and impacts of new instruments introduced in FP6

7.4 Funding mechanism and duration of the support

Funding takes the form of a “grant for integration”, which is a fixed amount to support the joint programme of activities. The grant is calculated on the basis of the number of researchers proposed for integration by the participants and the disbursement takes form in annual instalments. The scale of the grant varied from €1.5M to €17.3M throughout the projects granted in the Sixth Framework Programme.

The average duration of a Network of Excellence up to now has varied from 48 to 60 months depending on the thematic priority. A duration exceeding 60 months (in duly justified cases up to 84 months) could be accepted if this was necessary to achieve durable integration. There are networks with significantly shorter duration lasting only 18 months.

Given the requirement for durable integration to be achieved at the end of the period of EU support, it is now recommended to provide for a project duration of at least 48 months (and preferably 60) for NoEs. There are major concerns regarding the sustainability of the networks created by the instrument. NoEs interviewed found 4-5 years too short, 6-9 years was recommended instead, because real integration takes a long time.

Survey respondents were asked to indicate further attributes of the project they find optimal. Answers are represented in Figure 38.

Figure 37 Project attributes

<table>
<thead>
<tr>
<th>Project participants</th>
<th>Response (%)</th>
<th>Response count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum budget (€m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>16%</td>
<td>336</td>
</tr>
<tr>
<td>10</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Maximum duration (months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>19%</td>
<td>394</td>
</tr>
<tr>
<td>48</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>36%</td>
<td></td>
</tr>
</tbody>
</table>

7.5 Motivations, objectives for participation vs. expectations met

The primary reasons given for choosing NoEs over other forms of funding for networks include ability to build critical mass in terms of involvement in the sector, and in terms of project scale and duration. Also, NoEs were seen to be able to increase the range of types of participants. Least important was the idea that NoEs would potentially bring administrative simplification, or more control over the project. There were no significant differences between respondent groupings in these reasons.
Over 70% of respondents listed their primary motivation for participating in NoEs as either to ensure presence in the international research areas, or to develop new / improved relationships and networks. Of least importance was to develop new / improved commercial product or service. One notable difference between respondent groupings occurred between Higher Education Institutions and Industry where the former group placed a much greater importance on gaining access to facilities that do not exist in their own country.

The most common category of NoE in which respondents participated described a joint programme of activities combining joint research, shared information and joint knowledge exchange actions. There was a clear distinction between industry and Higher Education Institutions / Public Research Organisations in that proportionally fewer respondents from industry got involved in joint research, shared information and joint knowledge exchange actions.
Figure 40 Classification of NoEs by type

<table>
<thead>
<tr>
<th>Description</th>
<th>Response Percent</th>
<th>Response count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The network provided a joint programme of activities combining joint research, shared information and joint knowledge exchange actions</td>
<td>58.6%</td>
<td>252</td>
</tr>
<tr>
<td>The network mainly provided joint integrated research and training activities with some degree of institutional integration</td>
<td>20.2%</td>
<td>87</td>
</tr>
<tr>
<td>The network provided a coherent approach to scientific research and research based services, but did not involve a great deal of joint or integrated activity</td>
<td>13.0%</td>
<td>56</td>
</tr>
<tr>
<td>The network’s activities consisted of co-ordinating a small outsourced research programme</td>
<td>0.9%</td>
<td>4</td>
</tr>
<tr>
<td>The network mainly just supported members’ research projects</td>
<td>3.3%</td>
<td>14</td>
</tr>
<tr>
<td>The networks varied too much in character to chose one category</td>
<td>4.0%</td>
<td>17</td>
</tr>
</tbody>
</table>

Case studies reflected the survey results with regards the motivations of initiating or joining a Networks of Excellence. Most commonly reported objectives, expectations included:

- To address the fragmentation in the specific science field
- NoEs gave the opportunity to collaborate with more than the usual two to four partners and brought different types of expertise together
- Integration of the field and creation of new tools.
- Offer of important chance to have ‘good interactions’ with the European Commission

7.6 Results from the Network of Excellence projects

The most important tangible outputs for NoE participants were new publications and research projects. Conferences and training courses also scored well, and setting up new organisations or permanent networks also scored highly. This is a clear reflection of the composition of NoE participations involving mostly Higher Education Institutions. Due to the specific objectives and nature of the Networks there was not huge emphasis put on the potential for patent applications or spinouts.
Figure 41 Main outputs expected from NoEs (n=440)

The main intangible outputs considered important were new networks, relationships and colleagues and new scientific, technical knowledge. This echoes the responses to the same question asked to participants of IPs. Similarly, new commercial, market knowledge was again ranked as the least important to participants.

Figure 42 Main intangible outputs expected from NoEs (n=438)

Respondents, in the most part, felt that they had experienced unexpected positive benefits within their organisation. It is notable however that 28% of respondents did consider that they
had a negative experience as a result of participating in NoEs. As before, there were no significant differences across respondent groupings.

Figure 43 Unexpected benefits of participation in NoEs (n=335)

The views of the participants on the main outputs showed that there was a high level of agreement with the results of new relationships that will continue into future activities, including new research activities. The networks provided new opportunities for young researchers, for researchers to move between organisations and for established researchers, although less markedly than for young researchers. Collaboration on new activities is likely to continue, and new research activities are likely. The fact that the project was not supposed to fund actual research was considered a disadvantage, and as with the IPs, interdisciplinarity was considered important.

It is notable that many respondents felt that beyond the NoE projects there will be further collaborative research projects and that a permanent / formal network with at least some of the members will continue to exist.

Figure 44 Future of the network

<table>
<thead>
<tr>
<th>Future of the network</th>
<th>Response Percent</th>
<th>Response count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative research projects resulting from the network will take place</td>
<td>49%</td>
<td>218</td>
</tr>
<tr>
<td>A permanent/formal network with some of the members will continue to exist</td>
<td>41%</td>
<td>182</td>
</tr>
<tr>
<td>Other funded follow-on networking activities will take place</td>
<td>37%</td>
<td>163</td>
</tr>
<tr>
<td>Informal continued research collaboration will take place</td>
<td>36%</td>
<td>157</td>
</tr>
<tr>
<td>Other (non-funded) networking activities will take place</td>
<td>28%</td>
<td>124</td>
</tr>
<tr>
<td>A permanent/formal network with similar membership will exist</td>
<td>17%</td>
<td>76</td>
</tr>
<tr>
<td>Too soon to say</td>
<td>12%</td>
<td>53</td>
</tr>
<tr>
<td>A permanent/formal network with a larger membership will be set up</td>
<td>11%</td>
<td>47</td>
</tr>
</tbody>
</table>
Respondents were asked whether their NoE attempts to monitor integration amongst the members. 34% believed that some qualitative and quantitative monitoring took place, and 36% identified that a balanced set of indicators were used.

Figure 45 Monitoring and evaluation of NoEs

<table>
<thead>
<tr>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
</table>
| ![Monitoring and evaluation of NoEs](image)

7.7 Overall view on the Network of Excellence instrument

Due to the very demanding nature of the requirement for durable integration, Networks of Excellence require, from the very start, an active involvement at a strategic level of the participating institutions. These institutions have to be actively represented in the “governing board” that is expected to oversee the progress towards durable integration.

As with IPs, the final question of this section of the survey lists a series of statements that NoE participants were asked to either agree or disagree with. The results suggested that the instrument did achieve the aim of generating relationships; 86% of respondents agreed or strongly agreed that, as a result of their involvement in the network, they had formed relationships with partners that will continue into future activities. Indeed, 86% of respondents agreed or strongly agreed that following their involvement in the network they will continue to collaborate with members of the network on new activities. However, only 35% of respondents agreed or strongly agreed that there was a high level of commitment from their national research structures. The networks also appeared to suffer from being too diffuse 40% of respondents agreed or strongly agreed that the network was too big to enable real integration to take place, perhaps suggesting some partners were more actively involved than others. The networks were not always successful in generating institutional relationships with 48% of respondents agreeing or strongly agreeing that participation in the network was mainly at the level of individuals. The following chart provides an overview on the collaborative aspects of the Networks of Excellences.
The effectiveness, implementation and impacts of new instruments introduced in FP6

71% of respondents agreed or strongly agreed that interdisciplinarity was an important feature of the network. However, the lack of funds for actual research was a limiting factor in the achievements of the NoEs; 66% of respondents agreed or strongly agreed that the fact that the project was not supposed to fund actual research was a disadvantage to the effectiveness of the network. Furthermore, only 34% of respondents agreed or strongly agreed that the level of funding they received meant the network was a significant part of their activities. Figure 47 represents the survey responses regarding the scale and scope of the Networks of Excellences.

Figure 47 Scale and scope of the NoEs

<table>
<thead>
<tr>
<th>Scale of the NoEs</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don't Know / NA</th>
<th>No of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of participation in the network we are now exploring new research areas</td>
<td>8%</td>
<td>22%</td>
<td>38%</td>
<td>30%</td>
<td>2%</td>
<td>2.91</td>
</tr>
<tr>
<td>The scale of the project required more professional management of the project</td>
<td>17%</td>
<td>25%</td>
<td>28%</td>
<td>25%</td>
<td>6%</td>
<td>2.65</td>
</tr>
<tr>
<td>The network was too big to enable real integration to take place</td>
<td>24%</td>
<td>32%</td>
<td>22%</td>
<td>18%</td>
<td>3%</td>
<td>2.36</td>
</tr>
<tr>
<td>The level of funding we receive means the network is a significant part of our activities</td>
<td>35%</td>
<td>29%</td>
<td>21%</td>
<td>13%</td>
<td>1%</td>
<td>2.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope of the NoEs</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don't Know / NA</th>
<th>No of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>The fact that the project was not supposed to fund actual research was a disadvantage to the effectiveness of the network</td>
<td>11%</td>
<td>17%</td>
<td>24%</td>
<td>42%</td>
<td>6%</td>
<td>3.04</td>
</tr>
<tr>
<td>Interdisciplinarity was an important feature of the network</td>
<td>6%</td>
<td>22%</td>
<td>37%</td>
<td>34%</td>
<td>1%</td>
<td>3</td>
</tr>
<tr>
<td>The level of administrative work detracted from the research effort</td>
<td>8%</td>
<td>20%</td>
<td>35%</td>
<td>32%</td>
<td>4%</td>
<td>2.96</td>
</tr>
<tr>
<td>The differences between NoEs and the other research instruments were well explained at the time of the call</td>
<td>11%</td>
<td>20%</td>
<td>36%</td>
<td>26%</td>
<td>7%</td>
<td>2.84</td>
</tr>
</tbody>
</table>
Assessing the achievements and the organisation of the instrument, the overall picture is positive, especially with regards the development of new research activities and young researchers. 76% of respondents agreed or strongly agreed that the network resulted in the development of new research activities. In addition, 85% of respondents agreed or strongly agreed that the network provided opportunities for the development of young researchers. In addition almost three quarters of the respondents agreed or strongly agreed that participating in the network increased their capacity for research. Furthermore, 61% respondents reported enhanced carrier opportunities for those involved. Figure 48 summarises the benefits of participating in a Network of Excellence.

Overall the NoE case studies are quite positive, although they acknowledge that there are still many difficulties in scale and scope. It does appear that NoEs have been particularly important in encouraging interdisciplinarity and in overcoming fragmentation in some areas. They were also seen as an arena for the development of further research projects – often IPs. However the notion of excellence is still ill defined and understood.

Participants saw the lack of participation from business and industry as a failing but there were often problems in recruiting participants from those sectors. SMEs were also seen as important partners but they needed to be included and exploited effectively by the network. This also means that the SMEs have to be well chosen as in some instances the lack of impact was due to having the wrong partners. There was also an issue of uneven or ill-defined partnerships.

The balance of impact between the individuals and the institutions was an issue for the NoEs – some showed more impacts for individuals, with that being the unit of membership and changes in the network membership being in reality a reflection of changes of affiliation of the individuals concerned. This was also an issue with regards to the durability of the network with some institutions being cited as reluctant to commit to the establishment of permanent structures. That being said, NoEs have been used to reinforce and formalise existing networks and to strengthen many that were threatened by non-funding. In a few cases the networks seem to have played a catalytic role – while there might not be continuation in the current form, the period and activities of the network have been a necessary step in overcoming a fragmented research area.

National structures appear not to have been particularly supportive of the NoEs, and these national structural problems have hindered the creation of an integrated research agenda.
Finally the administrative burden is still seen as very high – this is despite the fact that strict management and a clear division of labour being seen as crucial to success. This suggests that there is a clear distinction between “management” and “administration” in people’s perceptions.
8 Conclusions

Overall the instruments have been perceived as a positive addition to the suite of mechanisms available under the Framework Programme. Although some time has been needed in order to understand and embed them in the system some of the earlier criticisms from previous studies have in the most part already been addressed. They have proved particularly positive in the development of interdisciplinarity and overcoming fragmentation in particular areas (the NoEs) and also in supporting new researchers through new knowledge, relationships and mobility (both IPs and NoEs). As such they contribute to the objective of creating a European Research Area. Most participants’ primary motive for participating was to ensure a presence in the international research area and to develop new or improved relationships.

There are still a number of issues to address and these are covered in the conclusions outlined below.

- Design issues
- Implementation
- Impact/Value added

8.1 Design

- The rationale for the instruments is clearly expressed and generally understood in terms of overcoming fragmentation and bringing people together at a sufficient scale to have a significant impact on the structure of European research.

- However the translations of the rationale into the specifications of the instruments caused some confusion for participants, particularly in the use of the concepts “critical mass”, “networks”, “excellence” and “integration”.

- In particular for NoEs, the original objectives of the instrument and the novel structure are reported as causing confusion. However overall the results from this study show a much higher degree of clarity in participants and a positive attitude towards the benefits of NoEs.

- The need for the instruments did not change dramatically over the period of the programme although there were some adjustments in the European research landscape. Other structuring instruments were also developed over the course of the programme but were considered to be complementary rather than competing.

- The Marimon report recommended a rebalancing between IPs and STREPS and a slight increase in STREPS and decrease in IPs was seen. There was also a clear decline in the number of NoEs in line with the strong decrease in the number of participants and EU funding.

- Overall in the period covered by the projects there is little evidence of a major structuring impact. In part this may be due to the implementation of the instruments. There may be more evidence in the Seventh Framework Programme as the majority of the FP6 projects are long in duration and therefore impacts are only now emerging.
8.2 Implementation

8.2.1 Implementation of the instruments

• As already highlighted, the main issue for implementation was the confusing terminology or lack of clear explanation when the instruments were introduced. This persists to some extent, in spite of concerted efforts to address this issue. In NoEs, the interpretation of the term “durable integration” and “networks” has perhaps led to an emphasis on science and research rather than organisational integration, which has impacted on the aforementioned durable integration. In IPs the size and interpretation of critical mass had been identified as a contentious issue in both the survey and previous studies.

• The issue of perception and understanding of the instruments was not helped by the way they were introduced in the work programmes and calls. The European Commission were initially quite prescriptive as to what instruments could be used. In some instances (eg in IST) the bulk of the initial budget was allocated for the new instruments with little understanding of what they were aiming to achieve. This led to frustration due to low success rates (fewer projects were funded due to their large size) and the exclusion of some of the smaller players.

• The initial mistakes in implementation of the work programmes were corrected in the lifetime of the programme. In FP7 even more flexibility and clarity can be seen with participants more able to define levels of critical mass for example, in the research areas proposed.

• A number of supporting activities, including the calls for expressions of interest, were designed to increase involvement and the constitution of consortia, but these for a did not add to the clarity of the objectives.

• In the case of Networks of Excellence, there was a more fundamental design issue. The fact that Networks could not fund direct research was cited as a major stumbling block to durable integration. This may result in two issues – projects finding creative ways to fund activities that are close to research but can be classified as ‘not research’ or some networks not being able to fully absorb their funding. This is something that is early to assess but needs to be kept under review.

8.2.2 Implementation of the projects

• The administrative burden of integrated projects has been noted and the European Commission are already aware of this issue.

• The regular reporting requirements were particularly difficult for the coordinating institutions. The budget for coordinating projects had not changed from the previous smaller instruments and was therefore felt to be inadequate.

• The need to write a project plan every 18 months was found to be excessive work, although some coordinators also used this as an opportunity for introducing flexibility.

• Adding new partners or partners leaving led to disproportionate levels of administrative procedures.

• Coordinators considered that sub contracting would be a useful mechanism, particularly when SMEs were involved in projects, reducing their administration requirements.

• The principle of collective responsibility was reported as one of the most burdensome and hindering factor for large IP consortia.

8.2.3 Participation issues

• New Member States involvement continued to be at a lower level that the EU15. In some thematic priorities the low level was more marked than others. Although this may reflect national research strengths, there remains a noticeable difference between the EU15 and the NMS. Hardly any NMS led an IP or an NOE.
• However, in spite of a lower level of participation, NMSs rated participation in IPs, for example, as a very valuable entry point into the European research arena. NMSs were more likely to cite access to capabilities and facilities that do not exist in their country as an important objective for participation. Additionally, for NMSs it was thought that future participation in FP7 might be dependent on at least marginal involvement in an FP6 project.
• SME participation continues to be low although proportional to overall industry involvement. SME involvement in IPs tended to be for more specialist services in one work package area.

8.3 Impacts/Value added

Overall is it still early to judge real impact, which is best seen once some time has elapsed and that a comparison could usefully be made at the end of FP7. However there are some good indications of the early impacts the projects have made in terms of integration.

• In the view of the participants the integration achieved in the projects has contributed to the development and consolidation of the European Research Area.
• In the view of the NCPs and the European Commission the instruments have contributed towards structuring and strengthening the European Research Area. Therefore although the views are complementary, there are slight perceptual difference between the participants and Commission and the NCPs.
• The critical role of the coordinator was emphasised in both IPs and NoEs with a need for strong leadership and good organisational skills in the coordinating institution. Integration within projects was best achieved where objectives were clear and well communicated.
• Networks of Excellence require an active involvement at the strategic level of participating institutions from the start. The balance of impact between the individuals and the institutions was an issue for NoEs. There was some concern that the network remained with the individual researcher rather than being embedded at the institutional level.
• In some cases the NoE has played a catalytic role in building and sustaining new relationships for future cooperation in fragmented research areas.
• Overall, both instruments put emphasis on the impacts of new relationships and new knowledge rather than new commercial applications. New research activities were also highlighted as being developed. The opportunities for post docs and new researchers were highlighted in both instruments as being positive.
• Interdisciplinarity is highlighted as a key factor in the success of the NoEs.
• In terms of size of IPs, there is a need for balance between the benefit of bringing together a large group and the difficulty in coordinating and organising a consortium. The benefits of larger projects were seen in some of the more fragmented research areas. Projects that had more difficulty integrating were those with more theoretical objectives.
• The NoEs were in general considered to be of the right size. The results showed that the common perception that NoEs are too big to function satisfactorily is not true. Although in the beginning there were a number of concerns, as the networks matured, the participants were able to appreciate the added value they returned. The case studies evidenced that the diverse composition of the networks and the large size of consortia was actually a key strength of an NoE as long as it was well coordinated.
• The term ‘critical mass’ was interpreted in a variety of ways among the project participants. The most common perception is that critical mass is achieved through integration of multiple disciplines and sectors to achieve common goals.
• Other than bringing together large consortium, many participants were still unclear about the overall objectives of the integrated projects and in, a small minority, of the difference between IPs and NoEs.
Many participants felt that a large number of members is not the most important aspect of critical mass, and that the bringing together of complementary expertise is the key feature.

In some cases the mobility of significant resources for expensive research and facilities was the key component of critical mass.

Efficiency gains were also evidenced in the ability of some partners to participate in a number of work packages within a project, minimising duplication of work and resulting in more cost effectiveness.

A minimum resource of manpower is required for the ambitious objectives of the projects, although some of the projects could still have achieved objectives with smaller numbers of participants.

There was evidence in some projects of relatively inactive participants or some who became obsolete. This was mainly due to unforeseen scientific developments and alterations in technologies but in some cases it was due to competing roles.

8.3.1 Sustainability

There were some concerns over the sustainability of the NoEs created by the instrument as real integration can take 6-9 years. There was still a general feeling that there will be collaborative research projects beyond the existing NoE projects and that permanent/formal networks will continue to exist albeit on a smaller scale.

In IPs. the lack of continuation following a project might lead to a large number of smaller competing projects which may be thought to contradict efforts that have been made to bring together the participants.

The study provides evidence that novel working relationships had been formed and that integration in terms of collaboration with research groups in a wide variety of fields has occurred. These new relationships are considered to be durable in the long term.

Thus, as stated above, the overall view on these instruments is positive, with evidence that this is a trend that has grown as the instruments have become more established and as the corrective measures have borne fruit.

What also emerged was that there are significant differences in the structure of the research constituencies across the programme. This leads to different requirements for research instruments and the balance between them. An overly prescriptive approach imposing uniformity risks not meeting the needs of the various sectors and their constituent organisations. The strength of the instruments lies not only in their intrinsic abilities to contribute to the realisation of the ERA, but in their complementarity with the remainder of the research and innovation instruments at national and at European level.