Evaluation of the Pertinence and Impact of the EU Support Actions to Research Infrastructures in the 6th Framework Programme

Technical Appendices

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Evaluation for the European Commission
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Evaluation for the European Commission

This impact assessment and ex post evaluation was commissioned by the European Commission's Directorate-Generals for Research and Information Society and Media. The impact study was carried out by a mixed team of experts from Matrix Insight Ltd in association with Rambøll Management and PREST/ Manchester Institute of Innovation Research at Manchester Business School. The team was led by Mrs Mariell Juhlin from Matrix Insight (mariell.juhlin@matrixknowledge.com). The research team consisted of Silja Korpelainen, Kristin Höltge, Benedicte Akre, Pawel Janowski, Kevin Marsh, Evelina Bertranou, Janne Sylvest, Xavier le Den, Jacques Viseur, Katleen Vos, Chris Fox and Kate Barker.

The evaluation was managed by Commission staff from Directorate-General for Research, Unit Research Infrastructures. Its progress was monitored by a steering group composed by Commission staff from DG Research and DG Information Society and Media.

Acronyms

CA	Co-ordination Actions
CERN	European Organization for Nuclear Research
DG INFSO	Directorate General Information Society and Media
DG RTD	Directorate General Research
DoW	Description of Work
EAV	European Added Value
EC	European Commission
ERA	European Research Area
ESF	European Science Foundation
ESFRI	European Strategic Forum on Research Infrastructures
FP	Community Framework Programme for Research
I3	Integrated Infrastructure Initiatives
RI	Research Infrastructures
SSA	Specific Support Actions
S&T	Science and Technology

Contents

Introduction to the technical appendices

This document provides supporting background information in relation to the final report on "The evaluation of the Pertinence and Impact of the EU Support Actions to Research Infrastructures in the Sixth Framework Programme", commissioned by the European Commission (DG RTD and DG INFSO)[1].

This document is intended as a stand alone, technical document, that describes the main methodologies and findings of the study.

It is structured according to the following format:

- Appendix A provides details of the main methodologies adopted in this study, which includes description of:
  - Delphi survey methodology
  - Rapid Evidence Assessment
  - Project survey methodology
  - Cluster analysis
  - Selection of case studies
  - Case study methodology
  - Economic assessment
  - Impact assessment
- Appendix B provides findings from the Delphi survey
- Appendix C provides findings from the Project survey
- Appendix D provides findings from Case studies
- Appendix E provides findings from the Economic assessment
- Appendix F provides findings from the Impact assessment

[1] Findings of the evaluation study are published in a Synthesis Report: Research Infrastructures in the Sixth Framework Programme: Evaluation of pertinence and impact, European Commission, 2009.

Appendix A – Detailed methodology

Overview of methodological approach used in the study

The work carried out in this study had two main focuses. The first focus was to establish the appropriate measures of impact, whereas the second focus has been to assess to what extent the impacts have been achieved. In addition, to place these onto a policy framework, a review of policy documentation was undertaken

The activities undertaken to determine and assess appropriate impact measures included:

- Two rounds of Delphi survey directed to experts in the field of RIs in Europe and analysis the results;
- Review of Descriptions of Work for the 83 projects; and
- Rapid Evidence Assessment

These activities helped to establish a framework for a set of impact measures that could be tested throughout the study. They also provided a backdrop against which to measure the types of impact project have achieved as a result of the EC funding.

With regards to the second focus of the study, activities undertaken to evaluate the extent to which the FP6 funded projects have achieved desired impacts included:

- Project survey directed to all participants of the 83 projects and analysis of the results;
- Analysis of results from 30 case study projects. Case studies primarily consisted of structured interviews with members of coordinating organisation as part of the field work exercise;
- Impact assessment via logistic regression using project survey data as a basis for statistical impact assessment.
- Economic assessment via logistic regression

These activities provided the evidence to ascertain to what extent the impacts have been achieved and further which factors of the Commission's involvement predict in achieving these impacts and how strong the relationship is.

The activities described above comprised three main datasets that have been analysed as part of this study. These are datasets based on the:

- Delphi survey;
- Project Survey; and
- Case studies.

The following sections describe more in detail how these activities were undertaken and the resulting findings.

As this study is essentially an impact assessment, a clear set of impact measures appropriate in the context of this study were needed. No readily available impacts measures existed, and to address this gap, Delphi method was adopted to explore a set of impact measures that could be adopted for the purpose of this evaluation. In essence, Delphi was used as a structured process for collecting and distilling knowledge from a group of European experts in the field of RI.

More specifically, the Delphi method is a form of group communication used to explore ideas within a geographically dispersed panel of experts. The purpose is to obtain insights of experts and use their informed judgements as systematically as possible to draw conclusions in a problem area. Delphi consists of a series of questionnaires that are sent to a group of experts. These questionnaires relate to two phases that are prominent in this method; that of 'exploration of ideas' and that of 'evaluation of the ideas generated' among the experts (Ziglio, E 1996)[2].

In this study, the aim of the Delphi was to gauge expert opinion and reach consensus on the types of impact that could and should be expected from investment in RIs. The Commission provided the research team contact details of experts that included programme committee members, ESRFI panel members, members of the Commission working groups and wide range of experts in the field from different member states with knowledge of a range of scientific areas.

The Delphi process consisted of two rounds of surveys aimed at European level experts in RIs. The first survey was sent to 275 participants, of which 83 responded, resulting in 30% response rate. Due to the relatively low response rate, the second survey was sent to the same 275 participants, in the hope that those that did not respond to the first survey might respond to the second survey. Overall, 29 participants responded to the second survey. There are many potential reasons for non-response. In some instances the participants informed the research team that they were already contributing to the European-level debate through other means (such as ESFRI), or that they had other engagements which took precedence over the survey. Despite a low response rate in the second survey, the results provide very valuable insight, in particular on what data could be used to measure relevant indicators.

The first Delphi questionnaire consisted of two sections, the first one inviting respondents to define relevant impact and the second asking respondents to assert what indicators are relevant and could be measured.

The first section asked whether the EU support actions on research infrastructures structure the European Research Area by:

- Influencing policy at regional, national or European level
- Influencing funding streams at regional, national or European level

The first section also asked whether EU support actions on research infrastructures:

- Deliver efficiency through economies of scale
- Lead to increased inter-disciplinarity; and
- Stimulate new initiatives

Out of 83 respondents, 14 individuals left the above five questions unanswered, and so these questions are analysed with reference to 69 respondents.

The first section also invited respondents to comment on what type of impacts are relevant when a timeframe is structuring the impact. This analysis is based on responses from 57 individuals, as 26 respondents left these questions unanswered.

The second section of the first questionnaire introduced list potential indicators and invited the respondents to assess whether they thought these indicators were relevant for measuring impact. Respondents were also asked to indicate if they were of the view that a quantifiable measure of this indicator could be developed, either by using exiting data or

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[2] Ziglio, E (2006) "The Delphi Method and its Contribution to Decision-Making" in Abraham, B and Ledolter, J eds. (2006) Introduction to Regression Modelling, Belmont: Thompson Brooks/Cole

collecting new data. The response rate to these questions varied between 59% and 70% of all respondents.

The purpose of the second questionnaire was to validate and build on the findings of the first questionnaire.

Rapid Evidence Assessment

The purpose of the Rapid Evidence Assessment (REA) was to search and critically appraise the academic research literature in a systematic and transparent way in order to achieve as balanced a view of what is already known about Research Infrastructures and the benefits associated with investment in them.

An REA methodology was selected to enable the research to inform the development of the programme logic models and appropriate outcome measures in order to inform the impact and economic modelling. The benefits of this systematic methodology are that it provides an unbiased method by which to filter and assess the evidence present in the published literature but is much quicker and easier to undertake than a fully fledged systematic review. While not as comprehensive as the systematic review (the REA method eschews grey literature and reference checking searches) it is generally considered robust enough for the purposes for which it is employed in this project.

The search strategy consisted of developing a number of search terms and then running these across seven major databases (ASSIA, ISI, Ovid, IBSS, Web of Knowledge, CSA and INSPEC). The search produced 532 distinct results. Abstracts of all these were then reviewed and 467 of them rejected based on the criteria outlined in the figure below. The 65 remaining articles were acquired and put through to a quick review stage to more completely assess their relevance and quality.

Reasons for Exclusion of Articles	
Number Excluded at Abstract Review	Reason for Exclusion
268	Not science/research policy relevant
144	No reference to measuring impacts
31	Missing abstracts/not in English
24	Duplications
Number Excluded at Quick Review	Reason for Exclusion
22	Not relevant/duplicate data
17	Unable to source
Number Passing Quick Review	Relevant
26	Included to analysis

Table 1: Reason for non-inclusion of reviewed articles

Of the 65 abstracts that passed to quick review, 26 were fully reviewed. Of the remainder, 22 were either found not to be as relevant as was supposed from their abstracts or duplications of the same results reported in a different format or journal. 17 documents are still in the process being acquired to inform the latter stages of the evaluation. However they could not be included in this initial analysis due to problems sourcing the documents (they were either missing from the libraries consulted, only available through inter-library loans or through full journal subscriptions).

The following table provides the literature references identified during the Rapid Evidence Assessment exercise that were fully reviewed.

Journal	Title	Author/s
International Nursing Review, vol. 53, no. 4, pp. 297-300, Dec 2006	Applying to the European Research Area Network Scheme (ERA-NET): collaborative working for nursing and midwifery research	Condell, S. L.; Fyffe, T.; Moreno-Casbas, T.; Poortvliet, P.; Wilkinson, J.; Egea-Zerolo, B.; Jones, C.
Technological Forecasting and Social Change, vol. 73, no. 7, pp. 860-885, Sept 2006	Joint R&D Projects: Experiences in the Context of European Technology Policy	Arranz, N.; Fernandez de Arroyabe, J. C.
Innovation: The European Journal of Social Science Research, vol. 19, no. 1, pp. 11-24, Mar 2006	New Views of Innovation Systems: Agents, Rationales, Networks and Spatial Scales in the Knowledge Infrastructure	Moulaert, Frank; Hamdouch, Abdelillah
Innovation: The European Journal of Social Science Research, vol. 19, no. 1, pp. 107-116, Mar 2006	INNOCULT Revisited: The Impact of EU Research Programmes on National Research Policies, Key Actors and Research Collaboration	Pohoryles, Ronald J.
European Political Science, vol. 5, no. 1, pp. 21-32, Mar 2006	A European Research Council (ERC) for the Social Sciences and Humanities: Pros and Cons	Follesdal, Andreas
Futures, vol. 37, no. 10, pp. 1159-1178, Dec 2005	Transdisciplinary Collaboration in Environmental Research	Pohl, Christian
Innovation: The European Journal of Social Science Research, vol. 18, no. 3, pp. 301-317, Sept 2005	Promoting Scientific Mobility and Balanced Growth in the European Research Area	Ackers, Louise
Innovation: The European Journal of Social Science Research, vol. 17, no. 3, pp. 187-204, Sept 2004	Something New in Old Europe? Innovations in EU-Funded Social Research	Wickham, James
Futures, vol. 36, no. 4, pp. 457-470, May 2004	Interdisciplinary Integration in Europe: The Case of the Fifth Framework Programme	Bruce, Ann; Lyall, Catherine; Tait, Joyce; Williams, Robin
Innovation: The European Journal of Social Science Research, vol. 16, no. 4, pp. 369-393, Dec 2003	From Research Policy to the Governance of Research? A Theoretical Framework and Some Empirical Conclusions	Feron, Elise; Crowley, John
Mediterranean Politics, vol. 8, no. 1, pp. 83-112, spring 2003	From Transnational R&D Co-Operation to Regional Economic Co-Operation: EU-Style Technology Policies in the MENA Region	Koehler, Sonja; Wurzel, Ulrich G.
International Journal of Social Economics, vol. 32, no. 11, pp. 939-950, 2005	Brain Drains and Brain Gains: Causes, Consequences, Policy	Hall, Peter
Policy Studies, vol. 26, no. 2, pp. 117-132, June 2005	Policy Benchmarking in the European Union: Indicators and Ambiguities	Room, Graham
International Journal of Technology Management	Inter-country technological linkages in European Framework Programmes: a spur to European integration?	Constantelou, A Tsakanikas, A Caloghirou, Y
Research policy. 36(4) 2007, 515-528. Publication	Technological knowledge base, R&D organization structure and alliance formation: evidence	Zhang, Jing [Authorship]. Baden-Fuller, C. [Authorship].

Journal	Title	Author/s
Type Article	from the biopharmaceutical industry.	Mangematin, V. [Authorship].
Environmental science and policy. 10(3) 2007, 260-266. Publication Type Article	Strengthening the science-policy interface: experiences from a European Thematic Network on Air Pollution and Health (AIRNET).	Totlandsdal, A.I. [Authorship]. Fudge, N. [Authorship]. Sanderson, E.G. [Authorship]. Bree, L., van [Authorship]. Brunekreef, Bert [Authorship].
Science and public policy. 31(3) 2004 June, 213-226. Publication Type Article	Searching for research integration across Europe: a closer look at international and inter-regional collaboration in France.	Okubo, Yoshiko [Authorship]. Zitt, Michel [Authorship].
Science and public policy. 29(6) 2002 December, 451-462. Publication Type Article	International dimension of research in Portugal: the European Research Area and beyond.	Pereira, Tiago Santos [Authorship].
European law journal. 12(5) 2006 September, 559-574.	The European research area: on the way towards a European scientific community?.	Elera, Alvaro, De [Authorship].
Evidence & policy. 2(2) 2006 May, 185-209.	RTD evaluation and policy in the European research area.	Schmidt, Evanthia Kalpazidou [Authorship].
Science and public policy. 32(5) 2005 October, 399-406.	Evaluating the European Union's Research Framework Programmes: 1999-2003.	Ormala, Erkki [Authorship]. Vonortas, Nicholas S. [Authorship].
Science and public policy. 32(5) 2005 October, 385-398.	What the evaluation record tells us about European Union Framework Programme performance.	Arnold, Erik [Authorship]. Clark, John [Authorship]. Muscio, Alessandro [Authorship].
Science and public policy. 32(5) 2005 October, 375-384.	Implementation of European research policy.	Siune, Karen [Authorship]. Schmidt, Evanthia Kalpazidou [Authorship]. Aagaard, Kaare [Authorship].
Science and public policy. 32(5) 2005 October, 367-374.	Trying to capture additionality in Framework Programme 5 - main findings.	Polt, Wolfgang [Authorship]. Streicher, Gerhard [Authorship].
Science and public policy. 32(5) 2005 October, 349-366.	Framework Programme 5 (FP5) impact assessment: a survey conducted as part of the five-year assessment of European Union research activities (1999-2003).	Guy, Ken [Authorship]. Amanatidou, Effie [Authorship]. Psarra, Foteini [Authorship].
Science and public policy. 32(5) 2005 October, 335-406.	Evaluation of European Union Framework Programmes: the 2004 five-year assessment.	Reeve, Neville [Authorship]. Smith, Keith [Authorship]. Guy, Ken [Authorship]. Amanatidou, Effie [Authorship]. Psarra, Foteini [Authorship]. Polt, Wolfgang [Authorship]. Streicher, Gerhard [Authorship]. Siune, Karen [Authorship]. Schmidt, Evanthia Kalpazidou

Table 2: REA references

Project survey methodology

The purpose of the Project survey was to gather evidence of the achievements of the 83 RI projects evaluated in this study from a variety of stakeholders (both project coordinators and participants).

Overview of data collection

The Project Survey was implemented as on-line web page-based questionnaire with the purpose to collect information regarding the projects' achievements to date. On-line survey was deemed to be the best method as information was sought from a large number of geographically spread stakeholders relating to the 83 projects.

The overall design of the survey questionnaire was informed by various exercises undertaken during the initial phases of the evaluation. The impact questions were influenced mainly by a Delphi survey of RI experts, a Rapid Evidence Assessment of literature and a review of programme and project documentation. For definitions of RIs and output measures, the questionnaire also drew upon a previous survey undertaken on the 'Trends in European Research Infrastructures' for the same directorate within the Commission.

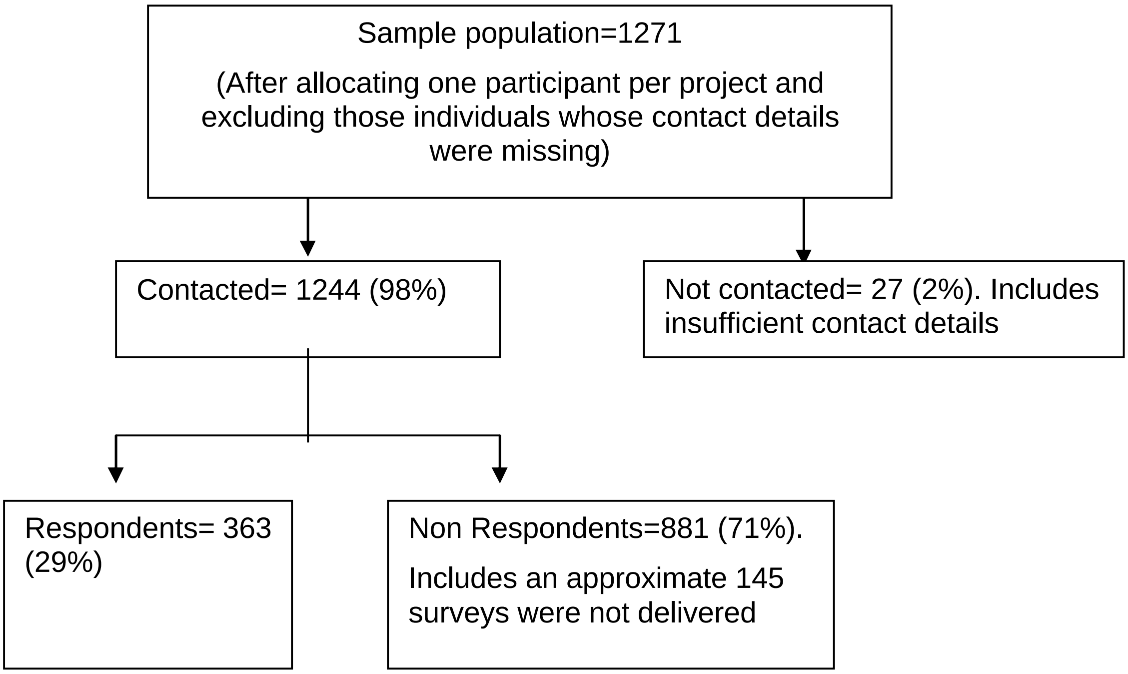
The questionnaire was addressed to all coordinators and participants in the 83 projects forming part of the evaluation. In order to enable a 'before and after' analysis of the survey data, respondents were asked, as far as possible, to assess the situation before FP6 funding was received and compare this with the situation after the funding ended or the current situation in the case of ongoing projects. The majority of the questionnaire consisted of questions addressed to the project participants with a minority addressed only to project coordinators.

Most questions were closed, with drop-down menus provided, and guidance for completion enclosed to facilitate completion by respondents. The decision to use closed questions wherever possible was driven by the need to obtain quantitative data for the initial 'before and after' data analysis as well as to feed into the subsequent modelling. Where necessary, qualitative data was also solicited with a view to providing further explanatory variables and context in order to interpret the quantitative data analysis.

Respondents who took part in multiple projects were randomly allocated to respond on behalf of one of the projects but were allowed to respond on behalf of additional projects upon request. Project coordinators were asked to respond on behalf of all the projects they were coordinators for. The initial survey population comprised of all project participants and coordinators totalling 1,244 individuals. In the end, the survey received 363 responses corresponding to 80 of the 83 projects[3].

The survey process is illustrated in the Figure below:

3 It is also important to note that an extra effort was made to try to secure good coverage of responses from project coordinators. Coordinators were personally telephoned to encourage participation.



Overview of data manipulation

The main approach to the survey analysis was to collect information that would support the case study selection and the development of the fieldwork tool. Therefore, the primary unit of analysis chosen were projects rather than the overall respondent level. This approach was chose as it would best facilitate the matching of survey results back to the project level as well as provide a balanced overview of results based on contracts and scientific domains. In this context it was of interest to analyse information around the 83 projects' achievements to date and what the implications of these findings would be with respect to levels and types of impacts to be expected from the projects.

In order to ensure accuracy and representativeness of the data from respondents, results hence needed to be condensed back to the 83 projects. The data at the respondent level was skewed towards those projects that had many respondents, which did not provide a balanced overview of the achievements of all the projects. In other words, it did not provide representative information to the questions asked in the survey, and the results were biased towards some projects over others. For example, integrating activity- I3 contracts were overrepresented at the respondent level (53% of respondents were from integrating activity-I3 contracts but only 39% of projects represented this type of contract). Furthermore, design studies and construction of new infrastructures were underrepresented at the respondent level. Of the respondents, 15% were from design studies although design studies only represent 23% of all contracts in the overall population. Similarly, only 3% of respondents represented construction studies although these comprise 11% of all projects. This was also the issue with scientific domains in that they did not accurately represent the balance of domains at the respondent level.

Therefore, all the responses were mapped back to individual projects and averaged so that there was one response per project. This provided representative data, which was free of the respondent level bias described above.

The data was aggregated so that each project had one response for each question posed in the survey. This meant that there was a chance that respondents for the same project did not provide the same answer. In these instances a clear method was applied to deal with the variance in responses. If the majority of respondents indicated the same answer to a question, this was taken as a response to that question.[4] In instances where there was not a clear answer based on a majority view, the answer to that question was coded to be a 'mixture' or 'a multiple set of objectives/outcomes'. The only section of the survey that could not be aggregated back to the project level was the section relating to the Research Infrastructure (RI). As the questions in this section were asked in relation to the RI, the responses were linked to that particular type of RI where the respondent was from.

[4] In relation to closed questions, majority view was based on more than 50% of respondents indicating the same answer. If the question was a multiple choice, majority did not need to be over 50%.

Therefore the responses varied according to the type of RI in question rather than the project itself. In this case the responses are more closely representative of the type of RI rather than the project. Therefore, this section had to be omitted from the project level analysis presented in this report. It is also important to note that the responses based on the RI section of the survey suffer from the respondent level biases indicated earlier. Furthermore, these responses are also not representative of the research infrastructures related to these projects and are biased toward those research infrastructures that provided most responses.

Overall, the assessment of the representativeness of the data showed that:

- § At the respondent level the distribution of responses based on type of contract were skewed towards integrating activity-I3 contracts that were overrepresented. Moreover, construction of new infrastructure projects and design studies were underrepresented when compared to the distribution of contracts in relation to distribution of contracts based on the 83 projects. This bias is not present at the project level analysis.
- § At a respondent level the distribution of responses by scientific domain shows that Environment and Earth Sciences and High Energy and Nuclear Physics are overrepresented in the survey responses. Moreover, Life Sciences and Biotechnologies are underrepresented when compared to the distribution of scientific domains in relation to distribution of scientific domains based on the 83 projects. This bias is not present at the project level analysis.

Cluster analysis

In order to understand whether certain types of projects seem to generate certain types of outcomes, cluster analysis was undertaken in order to see whether certain types of projects group together naturally. Characteristics that would act as defining factors to inform the grouping of 83 projects, based on similarities, were chosen on the basis of variables that were considered important. In order of importance, these were the following:

Categorical variables[5]:

1. improvements in the quality of RI in New Member States;
2. non-commercial use of research resources;
3. project outcomes;
4. type of contract;
5. liaison with local communities;
6. increased access to RI due to quality of IT;
7. total impact categorisation (low – medium – high); and
8. project objectives.

The first six of these eight variables were found to contribute to the developed clusters to the extent that it is statistically significant. Other variables taken into account included continuous variables. These were:

1. proportion of objectives project achieved;
2. proportion of outcomes project achieved;
3. the total amount of EC funding; and
4. the proportion EC funding of the total project budget.

[5] With respect to these categorical variables, it is important to note that categories needed to be reduced in order to create a meaningful analysis. Each of these variables were reduced to have three most frequently cited categories.

The first three of these four variables were found to contribute to the clusters developed to the extent that it is statistically significant.

The cluster analysis was produced using TwoStep Cluster Analysis on SPSS. This analysis procedure is an exploratory tool designed to reveal natural groupings (or clusters) within a dataset that would otherwise not be apparent. The TwoStep Cluster Analysis procedure is an exploratory tool designed to reveal natural groupings (or clusters) within a dataset that would otherwise not be apparent. The algorithm employed by this procedure has several desirable features that differentiate it from traditional clustering techniques:

- Handling of categorical and continuous variables. By assuming variables to be independent, a joint multinomial-normal distribution can be placed on categorical and continuous variables.

- Automatic selection of number of clusters. By comparing the values of a model-choice criterion across different clustering solutions, the procedure can automatically determine the optimal number of clusters.

The result was that two clusters were identified, one of 25 and one of 55 projects. Three projects had to be omitted because they had no survey response.

Selection of case studies

This section describes the selection of case studies. Initially three samples were created for comparative purposes. Of these, one sample was selected that comprised of the 30 case studies subject to field visits in summer 2008.

The “overview” section below briefly describes the three samples that were created. The section following the overview (“description of case study sample selected”) describes in detail the method for creating the sample that was chosen as basis for the case studies. This section also describes the sample and the profile of projects included as case studies.

Overview

The purpose was to select 30 case study projects from the total population of 83 projects. As with any sampling as soon as fewer than the entire population is selected it is important to decide what the ultimate aim of the exercise is and whether results need to be representative of the overall population or not.

The two basic approaches to sampling which can be adopted include probability and non-probability sampling. The former is selected in such a way as to be representative of the overall population whereas the latter is not, and does not aim, to be representative.

Stratified sampling[6] was used to derive two probability, random, samples of 30 projects from the 83. Purposive sampling was used to pick a non-probability sample.

In generating both random samples, the following main factors of importance were included:

- type of contract:
- research area/domain; and
- location: coordinator country.

For the second sample, an additional category was included to reflect the increases in impact and outcomes reported to be attributable to the FP6 RI funding by respondents. Impact was segmented into three levels:

[6] Stratified samples aim to reproduce/mirror the overall population. In order to derive a sample, the population is divided into factors of importance for the research. Great care needs to be taken in order to choose the right number of strata. For a small population such as is the case here, the number of strata would need to be clear cut and kept to a minimum to ensure that enough projects are selected within each stratum. Factors also need to be exclusive to each project. For instance type of RI could not be used as a factor for selection as more than one type of RI could be associated with each project.

- high;
- medium; and
- low.

The difference between probability and non-probability sampling is that the latter does not involve random selection whilst probability sampling does. The approach taken in selecting the non-probability sample was purposive i.e. the sampling followed a specific plan. The purpose was to make a selection of projects that seem a) to have made most progress towards fulfilling the objectives of the evaluation as defined in the Terms of Reference and b) those that for other reasons would be of interest to study. Five groups of criteria were developed to facilitate the selection. The four first corresponded to the four overall research questions defined in the terms of reference relating to: pertinence, impact, European Added Value and structuring effect. Within these, and based on the survey results, those project that reported fulfilment of most sub-criteria under each of these headings, based on the survey data, were selected. The fifth criteria put emphasis on project of specific significance or interest, groups of projects with extensive complementarities where it would be necessary to include several in order to capture the sum of all, and projects that had shown to be responsive to research for instance filling out the self-assessment survey or offering to be a pilot site for the testing of field work tools.

The case study sample used for the case study exercise is described in the section below.

Description of the case study sample selected

Aim

The aim was to achieve a random selection of 30 projects from a list of 83, with constraints. The constraints are designed to achieve good coverage of the levels of the important factors when sampling from a small population. Furthermore, the sample was to be enriched by including those projects with the highest or lowest impact scores. Ideally, the distribution of characteristics in the population of 83 projects should be reflected in the sample.

Introduction

The four main factors were:

(1) Country (5 levels)

(2) Type of contract (6 levels)

(3) Research area (8 levels)

(4) Impact (3 levels)

Research area (8 levels)	Contract (6 levels)	Country (5 levels)	Impact (3 levels)
Astronomy, Astroparticles and Space Technology	Integrating activity - integrated infrastructure initiative	United Kingdom	High
Engineering, Energy and Nanotechnologies	Integrating activity - coordination action	Germany	Medium
Environment and Earth Sciences	Design study	France	Low
High Energy and Nuclear Physics	Construction of new infrastructure	Italy	
Physics, Material Sciences and Analytical Facilities	Communication network development - coordination action	Other Europe	

Research area (8 levels)	Contract (6 levels)	Country (5 levels)	Impact (3 levels)
ICT - e-infrastructures & ICT and Mathematics	Communication network development - integrated infrastructure initiative	-	-
Life Sciences and Biotechnologies	-	-	-
Socio-economic Sciences and Humanities	-	-	-

<u>Method</u>

Together these four factors generate a cross-tabulation of 5x6x8x3 = 720 cells. The formal method to select a sample stratified by these four factors would require random sampling from each of these cells with a common sampling probability. This would provide a stratified random sample representative of the population. However, unless there are a reasonable number of projects in each cell from which to sample, this approach breaks down, and that is clearly the case here.

A degree of improvisation was therefore required. As Impact was of particular interest for this sample it was decided to force into the sample the four projects with the highest and the three with the lowest impact scores. These were as shown in the following table:

Project code	Category	Impact score[1]
EISCAT_3D	Low	1
BalticGrid	High	7
EU-NMR	High	7
GeneExpress	Low	1
EUTRICOD	Low	1
LASERLAB-EUROPE	High	6.8
IA-SFS	High	6.8

[1] Please refer to p. 129 for information on how these impact scores were calculated.

This left 23 projects to be sampled from the 72 with medium levels of Impact. It was observed that one level of factor (2), Type of Contract, known as 'Communication network development - coordination action', contained only 2 projects out of the population of 83 projects. Therefore coverage of the levels of this factor was going to be problematic. For this reason the sampling frame was based on the other two factors.

A 5x8 array was constructed using factors (1) and (3). An identification code and a random number was generated for each project and displayed in the appropriate cell of the array. The required sampling fraction was 23/72 = 0.31944. Ten cells were empty and ten contained only one project. These cells were not used. This meant that 20 out of 40 combinations of the levels of the factors (1) and (3) could not be included in the sample. This was considered to be acceptable, as no requirements for this second order coverage had been specified. It meant that projects of certain research areas that were uncommon in certain countries could not be selected.

The remaining cells each contained between 2 and 6 projects. The application of the 0.31944 sampling fraction implied that the numbers to be selected according to the numbers available were as follows:

Number of projects in cell	Number selected from cell	Sampling fraction	Contribution to sample
1	0	0	0
2	1	0.5	7
3	1	0.333	8
4	1	0.25	2
5	2	0.4	4
6	2	0.333	2
			Total = 23

This strategy provided a sample of 23 projects. The sampling within each cell was carried out by selecting the projects with the smallest random numbers.

Evaluation of the sample

The coverage of the levels of the three factors was evaluated by comparing the distributions of the resulting sample across the levels of each factor with the corresponding distributions of the population. The correspondences were satisfactory. The research area of 'Communication network development - coordination action' had a very small probability of being selected and was indeed not selected.

Note on calculation of impact scores

We used the impact section 7 of the project survey to determine impact scores for the projects. All the responses to each project were taken into account in the scoring and each response carried equal weight. Furthermore, all individual questions in section 7 carried equal weight.

If a respondent indicated in his/her answer to a question that something had increased or it was better because of the FP6 funding they received, a score 1 was given. All other answers received a score of 0.

As mentioned earlier, all the responses to each project were taken into account in the scoring. For example, when respondents' answers to a question were mixed for a given project, each of the answers were multiplied by the score (1 or 0) given to that answer. The total score for each question was the sum of all the scores to that question divided by the number of responses for that question.

As mentioned earlier, all the questions carried equal weight. Therefore, the maximum overall impact score that any project could obtain was 8.

This random sampling method resulted in the selection of 30 case studies, as described in the table below.

Project code	Description of project	Type of support action/contract	Research domain	Country	Impact
ALMA Enhancement	Enhancement of ALMA Early Science	Construction of new infrastructure	Astronomy, Astroparticles and Space Technology	Germany	Medium
BalticGrid	Baltic Grid	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	Sweden	High
BINASP	Bio-Nano European Infrastructure in AREA Science Park	Construction of new infrastructure	Life Sciences and Biotechnologies	Italy	Medium
DEISA	Distributed European Infrastructure for Supercomputing Applications	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	France	Medium
DesignACT	Designing the Aquaculture Centre of Technology - facing the unmet needs in European aquaculture	Design study	Environment and Earth Sciences	Norway	Medium
EGEE	Enabling Grids for E-science in Europe	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	Switzerland	Medium
EISCAT_3D	European Next Generation Incoherent Scatter Radar	Design study	Engineering, Energy and Nanotechnologies	Sweden	Low

Project code	Description of project	Type of support action/contract	Research domain	Country	Impact
ESSi	European Social Survey Infrastructure - Improving Social Measurement in Europe	Integrating activity - integrated infrastructure initiative	Socio-economic Sciences and Humanities	United Kingdom	Medium
EU-NMR	European Network of Research Infrastructures for providing Access and Technological Advancements in bio-NMR	Integrating activity - integrated infrastructure initiative	Life Sciences and Biotechnologies	Germany	High
EUDET	Detector Research and Development towards the International Linear Collider	Integrating activity - integrated infrastructure initiative	High Energy and Nuclear Physics	Germany	Medium
EuroCarbDB	Design Studies related to the development of distributed, Web-based European Carbohydrate Data Bases (EUROCarbDB)	Design study	Life Sciences and Biotechnologies	Germany	Medium
EUROFEL	European FEL Design Study	Design study	Physics, Material Sciences and Analytical Facilities	Germany	Medium

Project code	Description of project	Type of support action / contract	Research domain	Country	Impact
EURONS	EUROpean Nuclear Structure Integrated Infrastructure Initiative (EURONS)	Integrating activity - integrated infrastructure initiative	High Energy and Nuclear Physics	Germany	Medium
EuroPlaNet	European Planetology Network	Integrating activity - coordination action	Astronomy, Astroparticles and Space Technology	France	Medium
EUSAAR	EUropean Supersites for Atmospheric Aerosol Research	Integrating activity - integrated infrastructure initiative	Environment and Earth Sciences	France	Medium
EUTRICOD	European Training and Research Centre for Imported and Highly Contagious Diseases (EUTRICOD)	Construction of new infrastructure	Life Sciences and Biotechnologies	Germany	Low
GeneExpress	Design study for the creation of a gene expression analysis centre for early human development	Design study	Life Sciences and Biotechnologies	United Kingdom	Low
GN2	Multi-Gigabit European Academic Network	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	United Kingdom	Medium
Go4it	Promote Confidence in Future Information Technologies for the Valorisation of European Research Infrastructures	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	Germany	Medium

Project code	Description of project	Type of support action/contract	Research domain	Country	Impact
HYDRALAB-III	Integrated Infrastructure Initiative HYDRALAB-III	Integrating activity - integrated infrastructure initiative	Engineering, Energy and Nanotechnologies	Netherlands	Medium
IA-SFS	Integrating Activity on Synchrotron and Free Electron Laser Science	Integrating activity - integrated infrastructure initiative	Physics, Material Sciences and Analytical Facilities	Italy	High
IAGOS	Integration of routine Aircraft measurements into a Global Observing System	Design study	Environment and Earth Sciences	Germany	Medium
IMECC	Infrastructure for Measurement of the European Carbon Cycle	Integrating activity - integrated infrastructure initiative	Environment and Earth Sciences	France	Medium
int.eu.grid	Interactive European Grid	Communication network development - integrated infrastructure initiative	ICT - e-infrastructures	Spain	Medium
ITS LEIF	Ion Technology and Spectroscopy at Low Energy Ion Beam Facilities	Integrating activity - integrated infrastructure initiative	High Energy and Nuclear Physics	France	Medium
LASERLAB-EUROPE	Integrated European Laser Laboratories - LASERLAB-EUROPE	Integrating activity - integrated infrastructure initiative	Physics, Material Sciences and Analytical Facilities	Germany	High

Project code	Description of project	Type of support action/contract	Research domain	Country	Impact
MAX-INF2	European Macromolecular Crystallography Infrastructure Network 2	Integrating activity - coordination action	Physics, Material Sciences and Analytical Facilities	Sweden	Medium
NMI3	Integrated Infastructure Initiative for Neutron Scattering and Muon Spectroscopy	Integrating activity - integrated infrastructure initiative	Physics, Material Sciences and Analytical Facilities	United Kingdom	Medium
ProteomeBinders	A European Infrastructure of Ligand Binding Molecules Against the Human Proteome	Integrating activity - coordination action	Life Sciences and Biotechnologies	United Kingdom	Medium
VO-TECH	The European Virtual Observatory - VO Technology Centre	Design study	Astronomy, Astroparticles and Space Technology	United Kingdom	Medium

Table 3: Description of the characteristics of the impact sample

Further description of the random impact sample

This section shows the main characteristics of the selected 30 case studies, and compares them to the total population. The following tables show:

§ The distribution of countries of the 30 case studies, and the distribution of countries for all the projects;
§ the distribution of research domains of the 30 case studies, with indication of the distribution of research domains for all the projects;
§ the distribution of types of contracts of the 30 case studies, indication of the distribution of contacts for all the projects;
§ the distribution of impact levels of the 30 case studies indication of the distribution of impact levels for all the projects;
§ the number of participants by country; and
§ total EC funding by project code.

Country	Frequency	Percent	Valid Percent	Cumulative Percent
1 France	5	16.7	16.7	16.7
2 Germany	10	33.3	33.3	50
3 Italy	2	6.7	6.7	56.7
4 Other Europe[1]	7	23.3	23.3	80
5 United Kingdom	6	20	20	100
Total	30	100	100	

[1] Here 'other Europe' refers to Sweden (x3), Spain, Netherlands, Norway, Switzerland.

Table 4: Distribution of countries of the 30 case studies

Country	Frequency	Percent	Valid Percent	Cumulative Percent
1 France	16	19.3	19.3	19.3
2 Germany	24	28.9	28.9	48.2
3 Italy	9	10.8	10.8	59
4 Other Europe[1]	20	24.1	24.1	83.1
5 United Kingdom	14	16.9	16.9	100
Total	**83**	**100**	**100**	

[1] Here 'other Europe' refers to Netherlands (x5), Sweden (x4), Switzerland (x4), Belgium (x2), Norway, Spain, Cyprus, Greece.

Table 5: Distribution of countries of all the projects

Scientific Domain	Frequency	Percent	Valid Percent	Cumulative Percent
1 Astronomy, Astroparticles and Space Technology	3	10	10	10
2 Engineering, Energy and Nanotechnologies	2	6.7	6.7	16.7
3 Environment and Earth Sciences	4	13.3	13.3	30
4 High Energy and Nuclear Physics	3	10	10	40
5 ICT - e-infrastructures & ICT and Mathematics	6	20	20	60
6 Life Sciences & Biotechnologies	6	20	20	80
7 Physics, Material Sciences and Analytical Facilities	5	16.7	16.7	96.7
8 Socio-economic Sciences and Humanities	1	3.3	3.3	100
Total	30	100	100	

Table 6: Distribution of the research areas of the 30 case studies

Scientific Domain	Frequency	Percent	Valid Percent	Cumulative Percent
1 Astronomy, Astroparticles and Space Technology	11	13.3	13.3	13.3
2 Engineering, Energy and Nanotechnologies	7	8.4	8.4	21.7
3 Environment and Earth Sciences	12	14.5	14.5	36.1
4 High Energy and Nuclear Physics	9	10.8	10.8	47
5 ICT - e-infrastructures & ICT and Mathematics	16	19.3	19.3	66.3
6 Life Sciences & Biotechnologies	13	15.7	15.7	81.9
7 Physics, Material Sciences and Analytical Facilities	10	12	12	94
8 Socio-economic Sciences and Humanities	5	6	6	100
Total	83	100	100	

Table 7: Distribution of the research areas of all the projects

Contract type	Frequency	Percent	Valid Percent	Cumulative Percent
2 Communication network development - integrated infrastructure initiative	6	20	20	20
3 Construction of new infrastructure	3	10	10	30
4 Design study	7	23.3	23.3	53.3
5 Integrating activity - coordination action	3	10	10	63.3
6 Integrating activity - integrated infrastructure initiative	11	36.7	36.7	100
Total	30	100	100	

Table 8: Distribution of the types of contact of the 30 case studies

Contract type	Frequency	Percent	Valid Percent	Cumulative Percent
1 Communication network development - coordination action	2	2.4	2.4	2.4
2 Communication network development - integrated infrastructure initiative	11	13.3	13.3	15.7
3 Construction of new infrastructure	9	10.8	10.8	26.5
4 Design study	19	22.9	22.9	49.4
5 Integrating activity - coordination action	10	12	12	61.4
6 Integrating activity - integrated infrastructure initiative	32	38.6	38.6	100
Total	83	100	100	

Table 9: Distribution of the types of contract of all the projects

Impact category	Frequency	Percent	Valid Percent	Cumulative Percent
1 low	3	10	10	10
2 medium	23	76.7	76.7	86.7
3 high	4	13.3	13.3	100
Total	30	100	100	

Table 10: Distribution of the impact levels of the 30 case studies

Impact category	Frequency	Percent	Valid Percent	Cumulative Percent
1 low	3	3.6	3.8	3.8
2 medium	72	86.7	91.1	94.9
3 high	4	4.8	5.1	100
Total	79	95.2	100	
System[1]	4	4.8		
Total	83	100		

[1] We were unable to calculate impact scores for four projects due to lack of data

Table 11: Distribution of the impact levels of all the projects

Country	Number of participants
Germany	98
United Kingdom	64
France	56
Italy	43
Netherlands	26
Spain	25
Sweden	24
Poland	16
Switzerland	16
Hungary	13
Russian Federation	11
Austria	10
Denmark	10
Finland	10
Belgium	9

Country	Number of participants
Czech Republic	9
Portugal	9
Greece	6
Ireland	6
Israel	6
Norway	6
Bulgaria	5
Lithuania	5
United States	5
Estonia	4
Romania	4
China	3
Croatia	3
Latvia	3

Table 12: Number of participants by country

Project code	EC funding	Project code	EC funding
GN2	93,000,000	ITS LEIF	4,794,420
EGEE	31,870,000	VO-TECH	3,291,600
IA-SFS	27,000,000	BalticGrid	3,000,000
NMI3	21,000,000	EuroCarbDB	3,000,000
LASERLAB-EUROPE	14,200,000	IAGOS	2,577,000
EURONS	14,056,000	GeneExpress	2,198,139
DEISA	13,980,000	EUTRICOD	2,060,000
HYDRALAB-III	11,812,100	EISCAT_3D	2,017,445
EUROFEL	8,965,000	EuroPlaNet	2,000,000
ALMA Enhancement	8,518,360	int.eu.grid	1,990,000
EU-NMR	8,400,000	BINASP	1,912,120
EUDET	7,000,000	ProteomeBinders	1,799,984
IMECC	6,729,300	Go4it	1,000,000
ESSi	5,999,999	MAX-INF2	720,000
EUSAAR	5,100,000	DesignACT	475,400
		Total	310,466,866

Table 13: Total EC funding by project code

Case study methodology, including analysis approach

Overview of field work

The case studies were selected using a random sample.[7] The clear benefit of this is that the 30 cases selected are representative of all the 83 projects that are at the heart of evaluation.

The ten-people strong team of field researchers visited the sites of the coordinating organisation for each case study between May 2008 and June 2008[8]. During each visit, the field researcher aimed to speak to all key staff involved in the project on site. These were:

- Project director;
- Project coordinator;
- Project manager; and
- Members of project team.

Depending on the nature and size of the project, the three first roles were often performed by one and the same person.

The researchers also organised telephone interviews with at least two participant organisations for each case study. For integrated infrastructure initiative projects a couple of users per project were also interviewed either during the field visits or over the phone. The participant and user interviewees were selected by the researchers, in some cases based on recommendations from the coordinating organisation.

The interviews followed a structured format. The interviews with staff from the coordinating organisation lasted about 2-3 hours. Depending on the preference from the organisation, in some

[7] For specific details about the case study selection, please refer to pages 16-45 in this Appendix.

[8] Each researcher undertook an average of three case studies per person.

cases more than one person was interviewed at the same time. Interviews with participants were about an hour in length and could also take the form of a group or an individual interview. However, most of the interviews were individual interviews, including for users. User interviews were on average shortest in length, taking about half an hour each to complete.

On average between five to ten people were interviewed per project depending on the size and nature of the project. In total, 176 interviews were undertaken overall.

The structured fieldwork tool used by the researchers was piloted in two project sites prior to interviews taking place. These pilot sites formed part of the overall population of 83 projects but not of the 30 case studies. The tool itself was divided into sections and structured to respond to the Term of Reference for the study. The tool included questions relating to the project rationale and objectives. It also included questions relating to the types of impact generated on science communities, policy, economy/industry and wider society. Questions were also asked that would enable assessment of the pertinence of the programme in relation to the project outcomes, and ways in which the projects have contributed to the structuring of the European Research Area. Linked to this, questions to tease out the extent to which outcomes had been fully or partially enabled by the EC funding were also asked in order to assess the European Added Value.

The questions were also mapped in such a way that an assessment could be made about the added value of the European action and the contribution of the projects to the structuring of the ERA.

A response to the questions was typed during the interview. After the interviews, the answers to each question were rated by selecting the most appropriate option from a drop-down list incorporated into the field work tool. These ratings were then developed into a dataset and used for descriptive data-analysis of the results.

For the purposes of the analysis the responses were aggregated to a project level. This was based on a consensus view. In few instances where the members of the project team had provided a slightly different view, the field researcher made an overall judgement what the final answer to the question should be, based on the overall evidence.

The data was analysed using SPSS.

In addition, case study reports were also compiled for each case study project using a template that defined the type of information should go into each section. Where appropriate, this information was used to further qualify the nature of the findings from the descriptive data-analysis.

Overview of quantitative data analysis from case studies

The inclusion of predefined ratings for each question in the field work tool enabled the researchers to select the most appropriate code from a drop-down list in addition to the overall, open-ended answers. These ratings were then developed into a dataset and used for descriptive data-analysis.

The descriptive data-analysis produced presents the views expressed by the members of the coordinating organisation. This approach was taken as the aim was to ensure that the information presented was as representative of the projects as possible. The views of participants and users could not be included as number of participants and users varied by project and it was not possible to speak to a large enough samples for it to be representative of all projects. Therefore, the views of participants and users had to be excluded. However, their opinions are reflected in the qualitative findings from the case studies that are also used to support and qualify findings from the descriptive data-analysis.

The responses from the members of the coordinating organisation were aggregated at a project level. This was based on a consensus view. In few instances where the members of the coordinating organisation had provided a slightly different view, the field researcher made an overall judgement what the final answer to the question should be based on the overall evidence.

The data was analysed using SPSS.

Economic analysis methodology

Overview

The objective of the economic analysis was to determine whether FP6 projects are an efficient use of EC funding. This objective, the nature of the FP6 projects, the current knowledge about the economic value of the effects of the FP6 projects, as well as the design of the effect analysis had important implications for the type of economic analysis that could be undertaken, including:

1. As current economic research is unable to value the outcomes of the FP6 projects monetarily, and as the FP6 projects produce multiple outcomes, a cost-consequence analysis was adopted. That is, the cost of the FP6 project was compared against a range of outcomes.
2. The analysis undertaken is unable to say what would have happened in the absence of the FP6 project. As a result, the efficiency of the FP6 projects must be measured in relation to each other. That is, the analysis assessed the relative efficiency of each FP6 project – where FP6 funding produces the most output – rather than measuring whether the FP6 project is value for money – whether the effect of the FP6 projects justify their costs.
3. An European Commission (EC) perspective was adopted. While FP6 projects are funded from a range of sources, the analysis focused on the effect produced by EC-funding. Whether projects received funding from other sources would influence the effect that they achieve. As a result other funding sources must be included in the analysis if the effect of EC funding is to be isolated.

Therefore, the research question addressed in this analysis was, is a greater return achieved by funding certain types of FP6 project? Specifically, the following two questions are addressed:

1. Does one extra Euro invested in an I3 project produce a greater effect than one extra Euro invested in a SSA/CA project?
2. Does one extra Euro invested in a RTD project produce a greater effect than one extra Euro invested in an INFSO (e-infrastructure) project?

Detailed method

The economic analysis was divided into the following three stages:

1. A descriptive analysis of the funding (EC and other) received by FP6 projects and how this varied by instrument type, infrastructure type, and scheme type.
2. A bi-variate analysis of the relationship between EC funding and measures of the impact of FP6 projects.
3. A multivariate analysis of the relationship between EC funding and measures of the impact of FP6 projects, controlling for other possible explanations of effect.

The bi-variate and multivariate-analysis were run separately on two sets of projects (all projects, and then just I3 projects), as some of the measures of effect were considered pertinent for all projects and instrument types, but other measures were considered pertinent for just I3 projects.

The analysis of all projects was only undertaken for the following five effect measures:

- Liaison with local communities.
- Improvements in New Member States.
- Networking of researchers.
- Priority in national research policies.
- Industry participation.

These impact variables were selected on the basis that they were relevant for the whole sample of projects, including all instrument types (CA/SSA and I3).

The analysis of just I3 projects (n=43) was undertaken for the following four measures of effect:

- Number of young researchers.

- Quality of research infrastructure services.
- Equipment training.
- Integrated datasets.

Other measures of effect were considered pertinent to I3 projects. However they were not included in the analysis as they were considered less relevant given the timeframe of the evaluation. That is, those measures included in the economic analysis were those for which it was considered possible for I3 projects to influence within the timeframe of the evaluation.

The bi-variate analysis consisted in evaluating the relationship between impact variables and EC funding by calculating correlation coefficients –which represent a measure of the strength of the association between two variables. Statistical significance of the correlation coefficients was judged using the Wald statistic and its associated probability.

The purpose of the multivariate regression analysis was to evaluate the association between EC funding and measures of effect, controlling for other predictors of effect. For each effect measure, three different models were run. Model (a) estimated the effect of EC funding controlling for the following predictors:

1. Number of participants in the project.
2. Whether participants from New Member States were involved (Yes = 1, No = 0).
3. Whether participants from Non-EU Member States were involved (Yes = 1, No = 0).
4. Progress towards project's completion (in %).
5. The infrastructure type (INFSO=0; RTD=1).
6. The instrument type (CA/SSA=0; I3=1).

Two interactive predictors were also considered:

1. Model (b) included predictors (1) to (6) plus an interactive variable between EC funding and instrument type. This variable was introduced with the aim to test whether additional EC funding had a differential effect when applied to either instrument type. That is, does funding directed to I3 project produce a greater effect than funding directed to SSA/CA projects?
2. Model (c) included predictors (1) to (6) plus an interactive variable between EC funding and infrastructure type. Similarly, this variable was introduced to test whether additional EC funding had a differential effect when applied to either infrastructure type. That is, does funding directed to RTD projects produce a greater effect than funding directed to INFSO projects?

Given the binary nature of the impact variables, the multivariate regression analysis was run using the logistic regression function of SPSS (version 15). In common with the first analysis, a predictor was judged statistically significant if the associated probability of the Wald statistic was less than 0.10 (10%).

Please note that the aim of the economic analysis with respect to instrument type was to measure the differential effect of funding directed to I3 projects as opposed to other types of projects. This was due to the fact that I3 projects were considered different to other types of projects with regards to their key characteristics. I3 projects are a new instrument implemented for the first time under the FP6 and the activities of these projects are solely based on enhancing the functioning of existing research infrastructures. The SSA and CA instruments on the other hand are not new to FP programmes and the activities within these instruments relate to building new ambitious initiatives or building and designing new research infrastructures. Furthermore, as the sample size was small, it also made methodological sense to combine SSA and CA projects for the purposes of analysis and compare the differential effect of funding of these projects to the funding of I3 projects.

Impact analysis

Overview

The objective of the impact analysis was to determine which factors inherent in the FP6 projects predict the achievement of different types of impact. This is of importance in order to determine factors that are associated with impact and more importantly, which factors exacerbate the achievement of impacts.

Detailed method

Regression modelling was deemed to be the most appropriate method for the impact assessment, as it distinguishes between response (dependent) and explanatory (independent) variables. More specifically, it allows testing the influence of predictor variables on outcome (impact) variables, also controlling for the influence of other predictors. In accordance to the binary nature of outcome variables, it was of interest to investigate the presence or absence of a specific impact having been achieved by the projects. Logistic regression was adopted to this effect.

The dataset generated from the Project Survey was used as the basis for undertaking logistic regression analysis to determine the predictors of given outcomes[9]. Due to the small size of the case study data set it was not possible to use it for this purpose. Several attempts were undertaken but due to the small size it was not possible to detect a relationship between the predictor and impact variables. The project survey dataset however fitted well to the logistic regression and was hence used as the basis for the statistical impact analysis.

On the basis of the Project survey data set, a number of possible outcome variables and predictors were identified. In total there were twenty-one outcome (impact) variables and nine different predictors of impact. The nine predictors used in the analysis were:

1. Number of participants in the project.
2. If participants from New Member States were involved.
3. If participants from Non-EU Member States were involved.
4. Total EC funding.
5. Total project budget (incl. EC funding).
6. Percentage of total budget that is EC funded.
7. Progress towards the projects completion.
8. Whether the project was an RTD or INFSO project.
9. The project instrument (I3/CA/SSA).

The twenty-two outcome (impact) variables that were used in the analysis are listed in table below.

Outcome variable	Numerical coding
1. Overall impact score	Low = 0 High =1 Low consisted of overall impact scores from 0 to 4 High consisted of overall impact scores from 5 to 7
2. Expanded services	No = 0 Yes = 1
3. Industry use of RI	Unchanged = 0 Increased = 1 (No projects reported a decrease)
4. Remote use of RI	Unchanged = 0 Increased = 1

[9] Logistic regression was selected for the purposes of undertaking statistical impact assessment. This benefit of this method is that the outcome (dependent) variables are categorical and binary in nature. For example, a logistic regression can determine which of a number of predictors best predict industry participation in an RI.

Outcome variable	Numerical coding
	(No projects reported a decrease)
5. No. of non-European users	Unchanged = 0 Increased = 1 (No projects reported a decrease)
6. Joint projects with industry	Not expected = 0 Already realised/expected = 1
7. Generates IPRs/patents	Not expected = 0 Already realised/expected = 1
8. Generates spin-off companies	Not expected = 0 Already realized/expected = 1
9. New industrial processes	Not expected = 0 Already realised/expected = 1
10. Non-commercial use of resources	Not expected = 0 Already realised/expected = 1
11. Increased access due to IT quality	Not expected = 0 Already realised/expected = 1
12. Liaison with local communities	Not expected = 0 Already realised/expected = 1
13. Improvements in New Member States	Not expected = 0 Already realised/expected = 1
14. Number of young researchers	No change/negative change = 0 Positive change = 1
15. Quality of research data	No change/negative change = 0 Positive change = 1
16. Quality of RI services	No change/negative change = 0 Positive change = 1
17. Networking of researchers	No change/negative change = 0 Positive change = 1
18. Equipment training	No change/negative change = 0 Positive change = 1
19. Integrated data sets	No change/negative change = 0 Positive change = 1
20. Priority in National research policies	No change/negative change = 0 Positive change = 1
21. Industry participation	No change/negative change = 0 Positive change = 1

Table 14: List of outcome variables used in logistic regression[10]

[10] Note: Answers of 'Not applicable' were excluded from the analysis. Groups coded as 0 acted as the reference group in every analysis.

Two alternative approaches to the regression modelling were used in order to determine the best predictors. The first approach used each of the nine predictors individually to predict each of the twenty-two outcomes. Within this approach a single predictor (e.g. number of participants) was used to predict a single outcome (e.g. industry participation), in isolation from all other predictors. Statistical significance of each predictor was judged using the Wald statistic and its associated probability. A Wald statistic with a probability lower than 0.05 (5%) was taken to indicate a statistically significant predictor. This means that there is only 5% probability that this result occurred by chance. If statistically significant then that predictor can be reliably used to predict a change in the outcome.

In contrast, the second approach was more conservative and controlled for the joint influence of all of the predictors. Within this approach all nine predictors were used collectively to predict each of the twenty-two outcomes. The purpose of this approach was to determine the best predictors having controlled for their joint influence on the outcome. Whilst more conservative such an approach is generally regarded as more robust and greater confidence can be placed in the findings from such an analysis. In common with the first analysis, a predictor was judged statistically significant if the associated probability of the Wald statistic was less than 0.05 (5%).

Both individual and collective analyses were run using the logistic regression functions of SPSS (version 15). For each of the controlled analyses, diagnostic tests for multicollinearity were also run to test if the predictors are highly correlated with each other, which would have made the model unreliable. With the nine predictors used here, there were no serious issues of collinearity between the predictors. Tolerance levels ranged from 0.57 to 0.79, and VIF values ranged from 1.27 to 1.77.[11]

In total 210 logistic regression models were generated. Twenty-one of these models were controlled analyses (one for each outcome variable, with all predictors included), whilst the remaining 189 were individual analyses (nine for each outcome variable, each predictor entered individually).

[11] Tolerance values less than 0.1, or variance inflation factor (VIF) values greater than 10 were taken as indicators of serious collinearity problems.

Appendix B – Findings from the Delphi Survey

Overview

The purpose of the two Delphi survey rounds was to gain insight into what are the appropriate definitions and measures of impact that could be used to evaluate the effect that EU support actions have on Research Infrastructures.

The first Delphi questionnaire consisted of two sections, the first one inviting respondents to define relevant impact and the second asking respondents to assert what indicators are relevant and could be measured.

The first section asked whether the EU support actions on research infrastructures structure the European Research Area by:

- Influencing policy at regional, national or European level
- Influencing funding streams at regional, national or European level

The first section also asked whether EU support actions on research infrastructures:

- Deliver efficiency through economies of scale
- Lead to increased inter-disciplinarity; and
- Stimulate new initiatives

Out of 83 respondents, 14 individuals left the above five questions unanswered, and so these questions are analysed with reference to 69 respondents.

The first section also invited respondents to comment on what type of impacts are relevant when a timeframe is structuring the impact. This analysis is based on responses from 57 individuals, as 26 respondents left these questions unanswered.

The second section of the first questionnaire introduced list potential indicators and invited the respondents to assess whether they thought these indicators were relevant for measuring impact. Respondents were also asked to indicate if they were of the view that a quantifiable measure of this indicator could be developed, either by using exiting data or collecting new data. The response rate to these questions varied between 59% and 70% of all respondents.

The purpose of the second questionnaire was to validate and build on the findings of the first questionnaire. The findings of this are presented in conjunction with the responses to the first questionnaire.

The results were analysed using SPSS and Excel. The findings from the analysis are presented below.

Demography of Survey respondents

This section presents information about the demographics of those that responded to the survey.

Table 15 below shows that Delphi respondents were geographically spread across Europe, with the first Delphi attracting participants from 22 countries and the second Delphi from 10 countries. Overall, where country was known, most participants were from Italy, France, Switzerland and Germany.

Country	Delphi 1		Delphi 2		Overall	
	Number	Percent	Number	Percent	Number	Percent
Austria		0.0%	1	5.9%	1	0.9%
Belgium	1	1.2%	2	11.8%	3	2.6%
Croatia	1	1.2%		0.0%	1	0.9%
Czech Republic	1	1.2%		0.0%	1	0.9%
Denmark	2	2.4%		0.0%	2	1.8%
Estonia	1	1.2%		0.0%	1	0.9%
Finland		0.0%	1	5.9%	1	0.9%
France	8	9.6%	3	17.6%	11	9.6%
Germany	7	8.4%	1	5.9%	8	7.0%
Greece	3	3.6%		0.0%	3	2.6%
Iceland	1	1.2%		0.0%	1	0.9%
Ireland	1	1.2%		0.0%	1	0.9%
Israel	1	1.2%		0.0%	1	0.9%
Italy	10	12.0%	2	11.8%	12	10.5%
Lithuania	1	1.2%		0.0%	1	0.9%
Netherlands	1	1.2%		0.0%	1	0.9%
Poland	2	2.4%	1	5.9%	3	2.6%
Portugal	1	1.2%	1	5.9%	2	1.8%
Romania	4	4.8%		0.0%	4	3.5%
Slovakia	1	1.2%		0.0%	1	0.9%
Slovenia	2	2.4%		0.0%	2	1.8%
Spain	3	3.6%		0.0%	3	2.6%
Sweden	2	2.4%		0.0%	2	1.8%
Switzerland	6	7.2%	3	17.6%	9	7.9%
United Kingdom of Great Britain and Northern Ireland	5	6.0%	2	11.8%	7	6.1%
Unknown	18	21.7%	14	82.4%	32	28.1%
Total	**83**	**78.3%**	**17**	**100.0%**	**114**	**100.0%**

Table 15: Country of respondents

Table 16, below, shows that all the research domains were quite well represented in the responses to the first round of the survey. The responses were relatively equally split across the domains, with only ‘ICT and mathematics’, ‘physics, material sciences and analytical facilities’ and ‘astronomy astroparticles and space technology’ having comparatively fewer respondents. In contrast, in the second Delphi 4 domains were missing representation. Overall, where research domain was declared, most respondents were from life sciences and biotechnologies, ICT- e-infrastructures and engineering, energy and nanotechnologies.

Research domain	Delphi 1		Delphi 2		Overall	
	Number	Percent	Number	Percent	Number	Percent
Astronomy, Astroparticles and Space Technology	4	4.8%	1	3.2%	5	4.4%
Physics, Material Sciences and Analytical Facilities	2	2.4%		0.0%	2	1.8%
High Energy and Nuclear Physics	5	6.0%		0.0%	5	4.4%
Engineering, Energy and Nanotechnologies	7	8.4%	2	6.5%	9	7.9%
Environment and Earth Sciences	7	8.4%	2	6.5%	9	7.9%
ICT – e-infrastructures	7	8.4%	4	12.9%	11	9.6%
ICT and Mathematics	1	1.2%		0.0%	1	0.9%
Life Sciences and Biotechnologies	9	10.8%	4	12.9%	13	11.4%
Other...	15	18.1%	4	12.9%	19	16.7%
Socio-economic Sciences and Humanities	6	7.2%		0.0%	6	5.3%
Unknown	20	24.1%	14	45.2%	34	29.8%
Total	83	100.0%	31	100.0%	114	100.0%

Table 16: Research domain of respondents

Findings from the Delphi Surveys

This section describes the main findings from the two rounds of Delphi questionnaires.

EU support actions and the European Research Area

This section analyses the opinions of respondents to what extent they think the EU support actions on RIs structure the ERA via influencing policy and/or funding streams at regional, national or European level. The question is if these are considered as relevant impacts.

Table 17 below shows that a vast majority of respondents, 81.2% (56 out of 69) thought that EU support actions on RIs influence policy at regional, national or European level. Only four respondents (5.8%) thought that this type of impact was not relevant.

EU support actions on Research Infrastructures structure ERA by influencing policy at regional, national or European level		
Response	Number	Percent
a relevant impact	56	81.2%
insufficient insight to comment	9	13.0%
not relevant	4	5.8%
Total	69	100.0%

Table 17: EU support actions on Research Infrastructures structure ERA by influencing policy at regional, national or European level

Similarly, as Table 18 shows, a majority of respondents, 73.9% (51 out of 69) were of the view that EU support actions on RIs influence funding streams at regional, national and European level. However, 11 respondents (15.9%) considered that influence on funding streams was not relevant impact. This is in contrast to only 4 individuals (5.8%) who thought that influence on policy was not relevant. Therefore, it seems that impact on ERA is realised more strongly via influencing policy rather than funding streams at regional, national or European level.

EU support actions on Research Infrastructures structure ERA by influencing funding streams at a regional, national or European level		
Response	Number	Percent
a relevant impact	51	73.9%
insufficient insight to comment	7	10.1%
not relevant	11	15.9%
Total	69	100.0%

Table 18: EU Support actions on RIs structure ERA by influencing policy at regional, national or European level.

EU support actions and the catalysing effect

This section describes the respondents' views on whether the EU support actions deliver efficiency through economies of scale, encourage increased inter-disciplinarity, and/or stimulate new initiatives.

The results in Table 19 below show that delivering efficiency through economies of scale was not thought of as a particularly prominent outcome by the respondents. 43.4 % of respondents (30 out of 69) felt that this outcome was either not relevant or they thought they did not have enough insight to comment. Only 56.6% (39 out of 69) felt that delivering efficiency though economies of scale was relevant. In the second Delphi we asked respondents to reflect this finding and 63% of respondents (17 out of 27) either strongly or moderately agreed that this impact was not relevant. Only 7.4% of respondents (2 out of 27) strongly disagreed to this.

EU support actions on Research Infrastructures deliver efficiency in research through economies of scale		
Response	Number	Percent
a relevant impact	39	56.5%
insufficient insight to comment	15	21.7%
not relevant	15	21.7%
Total	69	100.0%

Table 19: EU support actions on Research Infrastructures deliver efficiency in research through economies of scale

Furthermore, a small minority of respondents considered that that EU funding towards RIs was too limited to promote any measurable impact. The findings from the second Delphi indicate that this is in fact a contested issue and no consensus exists. 29.6% (8 out of 27) of respondents moderate agreed whereas 25.9% (7 out of 27) moderately disagreed. Similarly, there was very little difference between those who strongly agreed and those who strongly disagreed.

In a similar vein, as is indicated in Table 20 below, a strong minority, 18.8% (13 respondents) thought that increased inter-disciplinarity is not a relevant impact. Nevertheless, a large majority, 73.9% (51 out of 69) thought that this kind of impact is relevant, leaving only 5 individuals who were unable comment. Moreover, increased inter-disciplinarity may be even more prominent feature of ICT-infrastructures as their applications often support interconnectedness thus inter-disciplinarity is a more natural progression of the types of infrastructures that they support.

EU support actions on Research Infrastructures lead to increased inter-disciplinarity		
Response	Number	Percent
a relevant impact	51	73.9%
insufficient insight to comment	5	7.2%
not relevant	13	18.8%
Total	69	100.0%

Table 20: EU support actions on Research Infrastructures lead to increased inter-disciplinarity

By far, it was considered that stimulating new initiatives is a very relevant impact, as Table 21 below indicates. 87% of respondents (60 out of 69) thought that this was the case, and only 4 individuals (5.8%) considered this was not a relevant impact. It seems that EU support actions furthermost have a catalysing effect, according to the respondents.

EU support actions on Research Infrastructures stimulate new initiatives		
Response	**Number**	**Percent**
a relevant impact	60	87.0%
insufficient insight to comment	5	7.2%
not relevant	4	5.8%
Total	**69**	**100.0%**

Table 21: EU support actions on Research infrastructures stimulate new initiatives

The findings from the second Delphi supported this position with 63% of respondents (17 out of 27) strongly agreeing that stimulating new initiatives was a vital outcome. Only one person moderately disagreed to this.

Taken together, all these results indicate that EU support actions have impact on structuring the ERA by influencing policy at regional, national or European level, and that EU support actions are particularly powerful in stimulating new initiatives.

EU support actions and short, medium and longer term impacts

This section describes the respondents' opinions on what timeframe (short, medium or long term) they expect the EU impact to mature and be prominent. The timeframes proposed were:

- First order impacts: short-term effects experienced by the research communities directly involved in a research infrastructure that receives FP6 funding
- Second order impacts: short to medium-term effects on regional, national and European research policy that result from the research infrastructure

- Third order impacts: medium to long-term effects on regional, national or European economies and societies

A large majority of respondents (52 out of 57) felt that short to medium-term effects on regional, national and European research policy that result from the research infrastructure were the most relevant type of impacts, as Figure below indicates. A small minority (8 out of 57) felt that they could not comment on the relevance of third order impact, which made it the least relevant impact, although more respondents indicated that first order impact was not relevant. However, this is only more respondents than in the case of third order impact (8 compared to 6).

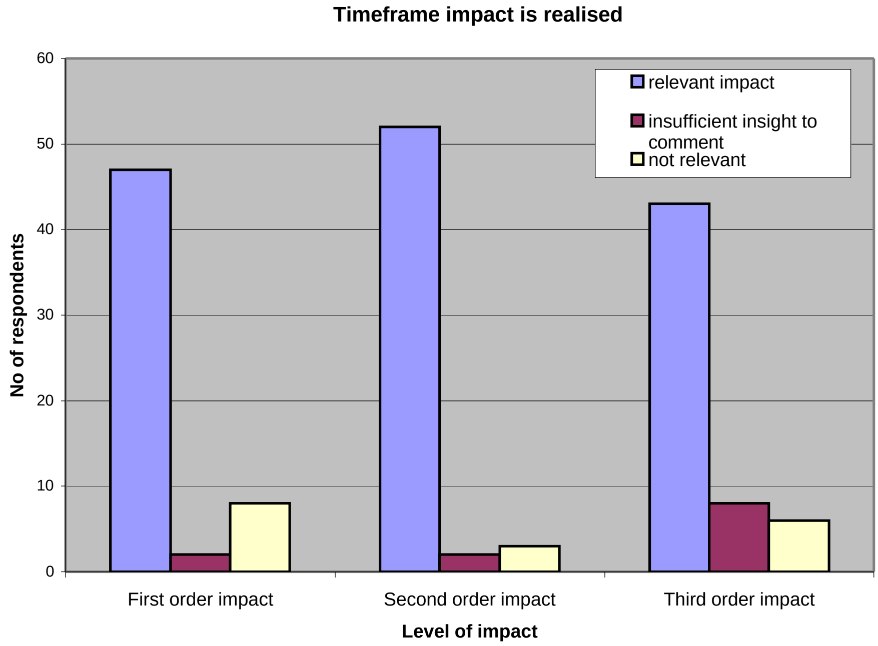


Figure 1: Relevance of timeframe to realising impact that EU support actions have

Our findings from the second Delphi supported the notion that medium term impacts are more important than either short or longer term impacts. 33% (9 out of 27) of respondents strongly agreed and 55.6% (15 out of 27) moderately agreed, leaving 3 individuals who disagreed moderately.

Additional measures of impact

In the first Delphi we invited respondents to propose additional indicators. The most prominent of these were also included to the second Delphi. Here we asked the respondents to state to what extent they agreed that EU support actions on European Research Infrastructures structure the European Research Area via the effect of these indicators. In total 26 respondents commented on these indicators[12]. The results of this are presented below.

The most prominent indicators suggested by respondents in first round were:

1. Increasing collaboration between Member States;
2. Affecting a cultural change;
3. Providing critical mass for the development/ adoption of new technology;
4. Integrating 'New Member States' into the European research community;

[12] The exception to this is “Integrating ‘New member States’ into European research community”, which was commented by 25 respondents rather than 26.

5. Allowing more coherent long-term infrastructure planning; and
6. Allowing wider access to research infrastructures.

The findings from the second round show that generally all these indicators were considered important in structuring the ERA with majority either strongly or moderately agreeing. In particular, however, respondents felt that allowing wider access to research infrastructures and increasing collaboration between Member States are particularly important in structuring the ERA. All respondents agreed either strongly or moderately to these statements, and particularly 73.1 % (19 out do 26) respondents strongly agreed that wider access is pertinent and 65.4% (17 out of 26) strongly agreed that collaboration between Member States is vital. Moreover, allowing more coherent long-term infrastructure planning was viewed as particularly important with 96.2% of respondents either agreeing strongly or moderately. In contrast, affecting cultural change was considered the least relevant of the proposed indicators with 30.8% (8 out of 26) respondents disagreeing either strongly or moderately. Nevertheless, as a whole, all these were considered as relevant by the majority of respondents.

Relevant indicators to measure impact

This section presents results from respondents' assessment about relevance of indicators and if these indicators could be measured, either by using existing data or collecting new data. The 48 indicators that we invited the respondents to assess were divided into six clusters, the number in brackets showing the number of indicators in each cluster:

- Indicators relating to impacts on research and research communities (11);
- Indicators relating to impacts on European Research (13);
- Indicators relating to RIs in Europe (7);
- Indicators relating to science and society (4);
- Indicators relating to European policy beyond research (6); and
- Indicators relating to impact on economy (7).

Our analysis found that out of 48 indicators only three were identified as not relevant. These were 'less research collaboration in Europe', 'improved social monitoring data' and 'improved understanding of European social problems'. Our analysis also identified 16 most prominent indicators whom over 85% of respondents considered relevant. These are presented in Table 22 .

With regards to the possibility of developing a quantifiable measure for these indicators, most respondents felt that these indicators could be measured to some extent with existing data but new data should also be collected. In response to this, we asked respondents in the second Delphi to indicate what data could be collected to measure these indicators. Our analysis of these found that two indicators, namely reinforcing EU leadership in some RI areas and improved international visibility and reputation for particular areas of science, are very similar in fact and therefore they are combined in our assessment.

Cluster name	Indicator name	Yes	%	No	%	Total respondents
Indicators relating to impacts on research and research communities	**Attraction of young talented researchers to the research area**	54	94.7%	3	5.3%	57
	Improved quality of research data	53	91.4%	5	8.6%	58
	Creating new networks of researchers	51	89.5%	6	10.5%	57
	Training more users of equipment	50	89.3%	6	10.7%	56
Indicators relating to impacts on European Research	**Opening up national research communities to transnational collaboration**	50	94.3%	3	5.7%	53
	Increased attractiveness (at a regional, state or European level) of an area to scientists	48	90.6%	5	9.4%	53
	Greater problem- solving capacity of European research	45	90.0%	5	10.0%	50
	More efficient use of R&D resources	47	88.7%	6	11.3%	53
Indicators relating to RIs in Europe	**Improving the quality of Research Infrastructure services**	49	96.1%	2	3.9%	51
	Reinforcing EU leadership in some RI areas	49	94.2%	3	5.8%	52
	Greater engagement of national funders with RIs	47	92.2%	4	7.8%	51
	Higher priority given to RIs in national research policies	45	88.2%	6	11.8%	51
	Creating awareness amongst national policymakers of specific character/needs of RIs	43	86.0%	7	14.0%	50
Indicators relating to science and society	**Improved international visibility and reputation for particular areas of science**	43	86.0%	7	14.0%	50
Indicators relating to European policy beyond research	**Integrated European data sets**	44	86.3%	7	13.7%	51
Indicators relating to impact on economy	**Greater industry participation in research**	43	87.8%	6	12.2%	49

Table 22: 16 most prominent indicators selected by respondents

Appendix C – Findings from the Project Survey

This section focuses on presenting the main findings of the project survey. The main aim of this section is to provide insight into the achievements of the projects to date by providing overall analyses and cross-tabulation of answers to questions posed to project participants and coordinators in the survey. Before providing these detailed findings, an overview of the respondent population will be provided.

The section has been structured in the following way to enable a better overview:

- Overview of respondents;
- Project level findings;

Overview of responses

Before outlining the survey findings it is important to understand the nature and characteristics of the respondent population.

This section describes the characteristics of the respondent population based on:

- § Types of institutions of respondents
- § Number of countries respondents were from
- § Number of coordinators and participants responding to the survey
- § Number of respondents per each project

Table 23 below shows that most respondents were either from a government/public institution or from university/higher education establishment.

Type of institution	Frequency	Percent
Governmental/public	148	42.2
International organisation	15	4.3
Private	20	5.7
University / higher education institution	138	39.3
Other	30	8.5
Missing	12	3.4
Total	363	100.0

Table 23: Number of respondents per institution

With regards to counties of respondents, most survey participants were from Germany (16.8%), followed by Italy (10.2%), France (9.9%), United Kingdom (8.5%) and Spain (7.2). The overall results by country are illustrated in Table 24 below.

Country	Number of respondents per country	Percent of respondents per country
AUSTRALIA	1	0.3
AUSTRIA	7	1.9
BELGIUM	11	3.0
BULGARIA	5	1.4
CHILE	1	0.3
CHINA	1	0.3
CROATIA	3	0.6
CYPRUS	5	1.4
CZECH REPUBLIC	3	0.8
DENMARK	8	2.2
EGYPT	1	0.3
FINLAND	5	1.4
FRANCE	36	9.9
GEORGIA	2	0.6
GERMANY	61	16.8
GREECE	13	3.6
HUNGARY	2	0.6
IRELAND	3	0.8
ISRAEL	3	0.8
ITALY	37	10.2
LEBANON	1	0.3
LITHUANIA	5	1.4
NETHERLANDS	19	5.2
NORWAY	4	1.1
POLAND	7	1.9
PORTUGAL	7	1.9
REPUBLIC OF KOREA	1	0.3
ROMANIA	5	1.4
RUSSIAN FEDERATION	4	1.1
SLOVAKIA	2	0.6
SLOVENIA	3	0.8
SPAIN	26	7.2
SWEDEN	14	3.9
SWITZERLAND	12	3.3
TURKEY	2	0.6
UKRAINE	4	1.1
UNITED KINGDOM	31	8.5
Unknown	8	2.2
Total	363	100.0

Table 24: Number of respondents by country

As for types of respondents, 54 coordinators responded to the survey which represents 65% of all coordinators. In addition, 309 participants who present 85.2% of all survey responses relating to the 83 project responded to the survey. These figures are shown in Table 25 below.

Type of respondent	Frequency	Percent
Co-ordinator	54	14.80%
Participant	309	85.20%
Total	363	100

Table 25: Type of respondent

With regard to numbers of respondents per project, projects with most respondents were responding on behalf of EGEE-II (3.86% of all respondents), HadronPhysics (3.58%) and SEADATANET, Black Sea SCENE and OPTICON (all three 3.31% of all respondents). Together these projects represent 17.4% of all respondents. Table 26 below shows the number of respondents per each project.

Project code	Number of respondents per project	Percent of all responses
ALMA Enhancement	1	0.28
ANNA	5	1.38
ARENA	6	1.65
AUGERACCESS	1	0.28
BalticGrid	2	0.55
BINASP	1	0.28
Bio-DNP	2	0.55
Black Sea SCENE	12	3.31
CARE	5	1.38
DEISA	3	0.83
DeNUF	2	0.55
DesignACT	1	0.28
DIRAC-PHASE-1	2	0.55
DIRACsecondary-Beams	8	2.20
EARLINETASOS	6	1.65
eDEISA	1	0.28
EGEE	3	0.83
EGEE-II	14	3.86
EISCAT_3D	1	0.28
ELT DESIGN STUDY	3	0.83
EMMAINF	3	0.83
ENSCONET	4	1.10
ESSi	3	0.83
ESTEEM	3	0.83
EU-ARTECH	5	1.38

Project code	Number of respondents per project	Percent of all responses
EUDET	8	2.20
EUFAR	10	2.75
EU-NMR	4	1.10
EUPRIM-NET	1	0.28
EURISOL DS	8	2.20
EUROCarbDB	3	0.83
EUROCHAMP	3	0.83
EUROFEL	6	1.65
EUROMAGNET	1	0.28
EURONS	11	3.03
EUROPLANET	8	2.20
EUROTeV	2	0.55
EuroVO-DCA	1	0.28
EUSAAR	5	1.38
EUTRICOD	1	0.28
EXPReS	3	0.83
felics	2	0.55
GeneExpress	1	0.28
GN2	4	1.10
Go4it	4	1.10
HadronPhysics	13	3.58
HELAS	5	1.38
HPC-EUROPA	3	0.83
HYDRALAB-III	10	2.75
IAGOS	2	0.55
IA-SFS	6	1.65
I-CUE	1	0.28
ILIAS	3	0.83
IMECC	10	2.75
int.eu.grid	6	1.65
ISIS TS2	1	0.28
ITHANET	7	1.93
ITS LEIF	3	0.83
KM3NeT	9	2.48
LASERLAB-EUROPE	6	1.65
LighTnet	2	0.55
L-SURF	1	0.28
MAX-INF2	6	1.65
MNT EUROPE	1	0.28
NERIES	8	2.20
NMI3	8	2.20
NoAH	1	0.28
OMII-Europe	2	0.55

Project code	Number of respondents per project	Percent of all responses
OPTICON	12	3.31
ProteomeBinders	5	1.38
RADIONET	5	1.38
SAXIER	2	0.55
SCIEnce	2	0.55
SEADATANET	12	3.31
SHARE-I3	8	2.20
SKADS	2	0.55
STAR	1	0.28
SYNTHESYS	7	1.93
TREEBREEDEX	9	2.48
VO-TECH	1	0.28
Total	363	100.00

Table 26: Number of respondents per project code

Overall, survey responses were missing for three projects. These were all construction of new infrastructures relating to Environment and Earth Sciences (Centre for Marine Chemical Ecology - Integrating ecological processes with molecular mechanisms), Life Sciences and Biotechnologies (The Centre for Integrated Structural Biology) and Socio-economic Sciences and Humanities (Distributed Access Management for Language Resources).

Describing the projects

Eighty two of the 83 projects started between 2004 and 2006. One started in 2007. Approximately a third (36.1 %, n = 30) of the projects were in their second year, a third (32.5 %, n = 27) were in their third year and a third (30.1 %, n = 25) were in their fourth year. The duration of the FP6 RI project contract for almost half (42.2%, n = 35) of the projects was 4 years. The duration of approximately a quarter (24.1%, n = 20) was 5 years and for the majority of the remaining projects the contract duration was 3 years (21.7%, n = 18). The majority of projects (68.7%, n = 57) were due to be completed in either 2008 or 2009. Table 27 shows reported progress towards completion. As can be seen, over a third of projects (38.6%, n = 32) were already completed[13], with most of the remaining projects between 50 and 90 percent complete.

Progress towards completion	Frequency	Percent
Less than 50% completed	9	10.8
50-74% completed	16	19.3
75-90% completed	26	31.3
Completed	32	38.6
Total	**83**	**100**

Table 27: Progress towards completion

A further breakdown by scientific domain is provided in Table 28. This shows that 13 out of 16 of the 'ICT - e-infrastructures & ICT and Mathematics' projects were completed – a larger proportion than for any other scientific domain.

[13] Those projects that finish 2008 were also classified as completed.

Scientific domain	Progress toward project completion			
	51-90% completed	completed	up to 50% completed	Total
Astronomy, Astroparticles and Space Technology	9		2	11
Engineering, Energy and Nanotechnologies	1	3	3	7
Environment and Earth Sciences	1	5	6	12
High Energy and Nuclear Physics	4	3	2	9
ICT - e-infrastructures & ICT and Mathematics	2	13	1	16
Life Sciences and Biotechnologies	4	4	5	13
Physics, Material Sciences and Analytical Facilities	7	2	1	10
Socio-economic Sciences and Humanities	2	2	1	5
Total	**30**	**32**	**21**	**83**

Table 28: Progress towards completion by scientific domain

The breakdown by type of contract shows that most communication network development projects have been completed, whereas many of the integrating activity projects are half way through to be completed. This is shown in Table 29 below.

Type of contract	Progress toward project completion			
	51-90% completed	Completed	up to 50% completed	Total
Communication network development - coordination action		2		**2**
Communication network development - integrated infrastructure initiative	2	9		**11**
Construction of new infrastructure	3	5	1	**9**
Design study	9	9	1	**19**
Integrating activity - coordination action	4	1	5	**10**
Integrating activity - integrated infrastructure initiative	12	6	14	**32**
Total	**30**	**32**	**21**	**83**

Table 29: Progress towards completion by contract type

For the 83 RI projects, respondents reported that the most common research area was ICT - e-infrastructures & ICT and Mathematics (n = 16), followed by Life Sciences and Biotechnologies (n = 13) and Environment and Earth Sciences (n = 12). The least common research area was Socio-economic Sciences and Humanities (n = 5). Further detail is provided in Table 30.

Research area	Frequency	Percent
Astronomy, Astroparticles and Space Technology	11	13.3
Engineering, Energy and Nanotechnologies	7	8.4
Environment and Earth Sciences	12	14.5
High Energy and Nuclear Physics	9	10.8
ICT - e-infrastructures & ICT and Mathematics	16	19.3
Life Sciences and Biotechnologies	13	15.7
Physics, Material Sciences and Analytical Facilities	10	12.0
Socio-economic Sciences and Humanities	5	6.0
Total	**83**	**100.0**

Table 30: Research area

The most common types of contracts represented in the responses were Integrating activities (integrated infrastructure initiative) (n = 32), followed by Design studies (n = 19) and Communication network development (integrated infrastructure initiative) (n = 11). Further detail is provided in Table 31.

Type of contract	Frequency	Percent
Communication network development - coordination action	2	**2.4**
Communication network development - integrated infrastructure initiative	11	**13.3**
Construction of new infrastructure	9	**10.8**
Design study	19	**22.9**
Integrating activity - coordination action	10	**12.0**
Integrating activity – integrated infrastructure initiative	32	**38.6**
Total	**83**	**100.0**

Table 31: Type of contract

The types of projects were further broken down by scientific domain and the results of this analysis are shown in Table 32. All of the 'ICT - e-infrastructures & ICT and Mathematics' projects were either a 'communication network development – coordination action' contract, or a 'communication network development – integrated infrastructure initiative' contract. Projects in the other scientific domains were either one of the following contract types: 'construction of new infrastructure', 'design study', 'Integrating activity - coordination action', or an 'Integrating activity - integrated infrastructure initiative'.

Scientific domain	Type of contract						
	Communication network development - coordination action	Communication network development - integrated infrastructure initiative	Construction of new infrastructure	Design study	Integrating activity - coordination action	Integrating activity - integrated infrastructure initiative	Total
Astronomy, Astroparticles and Space Technology			1	4	3	3	**11**
Engineering, Energy and Nanotechnologies			1	2		4	**7**
Environment and Earth Sciences			1	2	3	6	**12**
High Energy and Nuclear Physics			1	3		5	**9**
ICT - e-infrastructures & ICT and Mathematics	2	11		1		2	**16**
Life Sciences and Biotechnologies			3	3	2	5	**13**
Physics, Material Sciences and Analytical Facilities			1	3	2	4	**10**
Socio-economic Sciences and Humanities			1	1		3	**5**
Total	**2**	**11**	**9**	**19**	**10**	**32**	**83**

Table 32: Type of contract by scientific domain

The size of projects was examined in two different ways. Pre-existing data on the budget for the RI was used and project and coordinators were also asked about the numbers of users in the survey.

Table 33 below shows that the EC funding for the project varied from between 0.38 and 1.99 million Euros to over 10 million Euros.

Euros	Frequency	Percent
0.38-1.99M	19	22.9
2-4.99M	22	26.5
5M-9.99M	21	25.3
over 10M	21	25.3
Total	**83**	**100.0**

Table 33: Total EC funding for the project

These figures are further broken down by scientific domain in Table 34.

Scientific domain	Total EC funding for the project				
	0-1.99M	2-4.99M	5M-9.99M	Over 10M	Total
Astronomy, Astroparticles and Space Technology	1	3	4	3	**11**
Engineering, Energy and Nanotechnologies	1	1	3	2	**7**
Environment and Earth Sciences	2	5	4	1	**12**
High Energy and Nuclear Physics		1	4	4	**9**
ICT - e-infrastructures & ICT and Mathematics	7	3	1	5	**16**
Life Sciences and Biotechnologies	3	6	2	2	**13**
Physics, Material Sciences and Analytical Facilities	3	2	1	4	**10**
Socio-economic Sciences and Humanities	2	1	2		**5**
Total	**19**	**22**	**21**	**21**	**83**

Table 34: Total EC funding for the project by scientific domain

The EC funding in relation to contract types is shown in Table 35 below. It shows that integrating activity – integrated infrastructure initiatives received larger amounts of funding compared to other contract types.

Type of contract	Total EC funding for the project (grouping)				
	0-1.99M	2-4.99M	5M-9.99M	over 10M	Total
Communication network development - coordination action	2				**2**
Communication network development - integrated infrastructure initiative	4	2	1	4	**11**
Construction of new infrastructure	4	1	1	3	**9**
Design study	5	7	6	1	**19**
Integrating activity - coordination action	4	6			**10**
Integrating activity - integrated infrastructure initiative		6	13	13	**32**
Total	**19**	**22**	**21**	**21**	**83**

Table 35: Total EC funding for the project by contract type

The amount of EC funding can be compared with the proportion that this EC funding constitutes in the overall funding for each project. For 22 projects (26.5% of the total) EC funding represents between 0 and 50 per cent of funding. 30 projects (36.1% of the total) reported that EC funding made up between 51 and 75 percent of funding, and 31 projects (37.3 % of the total) reported levels of EC funding to reach between 76 and 100 per cent of their total funding.

Proportion of total funding represented by EC funding	Frequency	Percent
0-50%	22	26.5
51-75%	30	36.1
76-100%	31	37.3
Total	**83**	**100.0**

Table 36: Proportion of total funding represented by EC funding

In Table 37 these figures are further broken down by scientific domain.

Scientific domain	Percentage EC funding is of the total project cost			
	0-50%	51-75%	76-100%	Total
Astronomy, Astroparticles and Space Technology	4	4	3	**11**
Engineering, Energy and Nanotechnologies	3	4		**7**
Environment and Earth Sciences	1	6	5	**12**
High Energy and Nuclear Physics	5	2	2	**9**
ICT - e-infrastructures & ICT and Mathematics	1	9	6	**16**
Life Sciences and Biotechnologies	3	3	7	**13**
Physics, Material Sciences and Analytical Facilities	2	2	6	**10**
Socio-economic Sciences and Humanities	3		2	**5**
Total	**22**	**30**	**31**	**83**

Table 37: Proportion of total funding represented by EC funding by scientific domain

With regard to the contract types it can be seen that integrating activity projects and communication network development – coordination action had the largest proportion of the total project cost funded by the EC.

Type of contract	Percentage EC funding is of the total project cost			
	0-50%	51-75%	76-100%	Total
Communication network development – coordination action			2	**2**
Communication network development - integrated infrastructure initiative	1	7	3	**11**
Construction of new infrastructure	9			**9**
Design study	8	7	4	**19**
Integrating activity - coordination action		4	6	**10**
Integrating activity - integrated infrastructure initiative	4	12	16	**32**
Total	**22**	**30**	**31**	**83**

Table 38: Proportion of total funding represented by EC funding by contract type

Project level findings

The purpose of this section is to provide an overview of the overall survey findings based on projects' reporting of:

- Objectives, outcomes and anticipation of impact at the start of the project in relation to achieved impact;
- Immediate outcomes;
- Impacts on scientific communities, RI and beyond;
- Movement towards achieving longer-term impacts;
- Added value from European funding;
- Pertinence of funding in relation to needs.

The section is structured to provide:

§ Summaries of answers to questions in the survey questionnaire;

§ Results by type of scientific domain; and

§ Results by type of contract.

Objectives and outcomes of participation

Respondents were asked what the focus of their institution's activity in the FP6 RI project was (as a participant not including any coordinating role they may also have). The most common response was networking and general exchange of information with partners (relevant to 85.5 per cent of projects). The different focuses identified and the proportions of projects to which these are relevant are set out in Table 39. Note that more than one response was possible for participant and so frequencies do not sum to 83 (the total number of projects).

Focus of institution's activity in the FP6 RI project	Frequency	Percent
Exchange researchers with partners	14	16.9
Coordinating access or providing a service	38	45.8
Conducting joint research	58	69.9
Conducting joint design and development	54	65.1
Developing tools and equipment	52	62.7
Developing or proving shared resources such as data bases or protocols	41	49.4
Developing or providing online capability and services for Research (such as grid technology with partners)	20	24.1
Networking and general exchange of information with partners	71	85.5

Table 39: Focus of your institution's activity in the FP6 RI project

A more detailed breakdown of 'networking and general exchange of information with partners' is provided in Table 40. This shows that networking and general exchange was an objective for participants associated with all 16 of the projects in the ICT - e-infrastructures & ICT and Mathematics scientific domain - a higher proportion than for any other domain.

Scientific domain	Networking and general exchange of information with partners a focus of institutions activity					
	No survey response	No question response	mixture	no	yes	Total
Astronomy, Astroparticles and Space Technology		1	1		9	**11**
Engineering, Energy and Nanotechnologies		1		1	5	**7**
Environment and Earth Sciences	1		1	1	9	**12**
High Energy and Nuclear Physics			1		8	**9**
ICT - e-infrastructures & ICT and Mathematics					16	**16**
Life Sciences and Biotechnologies	1			1	11	**13**
Physics, Material Sciences and Analytical Facilities				1	9	**10**
Socio-economic Sciences and Humanities	1				4	**5**
Total	**3**	**2**	**3**	**4**	**71**	**83**

Table 40: focus of your institution's activity in the FP6 RI project by scientific domain

Table 41 below shows the extent of networking and general exchange of information with partners as a focus of institutions activity in relation to the contract type. It can be seen that this is clearly a focus of all integrating activity and communication and network development projects.

Contract type	Networking and general exchange of information with partners a focus of institutions activity					
	no survey response	no question response	mixture	no	yes	Total
Communication network development - coordination action					2	**2**
Communication network development - integrated infrastructure initiative					11	**11**
Construction of new infrastructure	3	1	1	2	2	**9**
Design study			1	2	16	**19**
Integrating activity - coordination action					10	**10**
Integrating activity - integrated infrastructure initiative		1	1		30	**32**
Total	**3**	**2**	**3**	**4**	**71**	**83**

Table 41: Focus of institution's activity in the FP6 RI project by contract type

Respondents were asked what the main objectives were for their organisation to take part in the RI FP6 project. Table 42 shows the responses they gave in relation to the projects they were linked to. For eighteen of the projects (21.7%), respondents specified 'taking part in building European infrastructures' as the main objective for their organisation to take part. However, the majority of respondents identified multiple objectives. The proportion identifying up to 49 per cent of the objectives, 50 – 74.9 per cent of the objectives and 75 per cent or more of the objectives is set out in Table 4243. This table shows that many organisations took part in the FP6 project in order to achieve a number of different objectives.

Objectives	Frequency	Percent
No survey response	3	3.6
No question response	2	2.4
Gain funding	2	2.4
Improve access to my RI	1	1.2
Improve coordination with other RIs	3	3.6
Improve quality of my RI	2	2.4
Network with other RIs	3	3.6
Take part in building European infrastructures	18	21.7
Multiple set of objectives	49	59.0
Total	**83**	**100.0**

Table 42: Objectives for the organisations taking part in the FP6 project

Percentage of objectives to be achieved	Frequency	Percent
No survey response	3	3.6
No question response	2	2.4
50-74.9%	19	22.9
75% or over	36	43.4
up to 49%	23	27.7
Total	**83**	**100.0**

Table 43: Percentage of objectives to be achieved

Respondents were also asked to what extent their organisation had achieved its objectives in participating in the RI project. These findings are shown in Table 44. Almost two thirds of projects (60.2%, n = 50) reported that they had met their objectives fully. This figure is high when it is remembered that only just over a third of projects (38.6%, n = 32) were already completed. Of those who answered ‘not at all’ or ‘partially’, the vast majority reported that their organisation’s objectives would be met in the next 3 years.

Extent to which objectives met	Frequency	Percent
No survey response	3	3.6
No question response	2	2.4
Exceeded	2	2.4
Fully	50	60.2
Mixed	15	18.1
Partially	11	13.3
Total	**83**	**100.0**

Table 44: Extent to which organisation achieved its objectives in participating in the RI project

This data is further broken down by scientific domain in Table 45. It is notable that:

- All of the projects in the High Energy and Nuclear Physics domain had met their objectives.
- Eighty per cent of the projects in the Physics, Material Sciences and Analytical Facilities and the Socio-economic Sciences and Humanities domains had met their objectives.

- Seventy five per cent of the projects in the ICT - e-infrastructures & ICT and Mathematics domain had met their objectives.
- Only 25% of the projects in the Environment and Earth Sciences domain had met their objectives.

Scientific domain	To what extent has your organisation achieved its objectives in participating in the RI project						
	No survey response	No question response	Exceeded	Fully	Mixed	Partially	Total
Astronomy, Astroparticles and Space Technology				4	4	3	**11**
Engineering, Energy and Nanotechnologies		2		3		2	**7**
Environment and Earth Sciences	1			3	5	3	**12**
High Energy and Nuclear Physics				9			**9**
ICT - e-infrastructures & ICT and Mathematics				12	2	2	**16**
Life Sciences and Biotechnologies	1		2	7	2	1	**13**
Physics, Material Sciences and Analytical Facilities				8	2		**10**
Socio-economic Sciences and Humanities	1			4			**5**
Total	**3**	**2**	**2**	**50**	**15**	**11**	**83**

Table 45: Extent to which organisation achieved its objectives in participating in the RI by project by scientific domain

With regards to the contract types the data in Table 46 shows that:

§ Integrating activity – coordination action is the only contract type for which less than 50% of the projects have fully met their objectives. Only 40% of the projects reported that they had done so.

§ Communication network development - integrated infrastructure initiative was the most likely contract to have fully achieved their objectives, with 82% of all the projects reporting this.

§ Integrating activity - integrated infrastructure initiative projects were also likely to fully have achieved their objectives, which was reported by 66% of all the projects.

§ Communication network development - coordination action, Construction of new infrastructure and Design study projects reported that 50-56% of their projects had met their objectives.

Type of contract	To what extent has your organisation achieved its objectives in participating in the RI project						
	No survey response	No question response	Exceeded	Fully	Mixed	Partially	Total
Communication network development - coordination action				1		1	**2**
Communication network development - integrated infrastructure initiative				9	2		**11**
Construction of new infrastructure	3			5		1	**9**
Design study		1	1	10	3	4	**19**
Integrating activity - coordination action				4	4	2	**10**
Integrating activity - integrated infrastructure initiative		1	1	21	6	3	**32**
Total	**3**	**2**	**2**	**50**	**15**	**11**	**83**

Table 46: Extent to which organisation achieved its objectives in participating in the RI by project by contract type

Immediate outcomes

Respondents were asked to identify the most important outcomes for their organisation from the RI project. Table 47 shows the responses they gave in relation to the projects they were linked to. For approximately two thirds of projects (61.4%, n = 51) the most important outcome was to upgrade the facility.

Outcome	Frequency	Percent	Valid Percent	Cumulative Percent
No survey response	3	3.6	3.6	3.6
Built European infrastructure	2	2.4	2.4	6.0
Built European networks	1	1.2	1.2	7.2
Improved quality of data	1	1.2	1.2	8.4
Multiple set of outcomes	19	22.9	22.9	31.3
Research results	6	7.2	7.2	38.6
Upgraded the facility	51	61.4	61.4	100.0
Total	**83**	**100.0**	**100.0**	

Table 47: Most important outcomes for participating organisations from the RI project

These findings are further broken down by scientific domain in the table below. Upgraded facilities were relevant to projects from all scientific domains, but were identified in a particularly high proportion of projects in the following domains: Astronomy, Astroparticles and Space Technology; Environment and Earth Sciences; and High Energy and Nuclear Physics.

Scientific domain	Outcomes for your organisation in participating to FP6 project							
	No survey response	Built European infrastructure	Built European networks	Improved quality of data	Multiple set of outcomes	Research results	Upgraded the facility	Total
Astronomy, Astroparticles and Space Technology					2		9	**11**
Engineering, Energy and Nanotechnologies					2	2	3	**7**
Environment and Earth Sciences	1				2		9	**12**
High Energy and Nuclear Physics					1		8	**9**
ICT - e-infrastructures & ICT and Mathematics				1	4	2	9	**16**
Life Sciences and Biotechnologies	1	2			4	1	5	**13**
Physics, Material Sciences and Analytical Facilities			1		3		6	**10**
Socio-economic Sciences and Humanities	1				1	1	2	**5**
Total	**3**	**2**	**1**	**1**	**19**	**6**	**51**	**83**

Table 48: Most important outcomes for participating organisations from the RI project by scientific domain

In terms of the contract types, upgrading facilities was relevant for all contract types but particularly important for Integrating activity - coordination action projects as 90% of them stated it as an outcome. This was the least important reported outcome for construction of new infrastructure and design study projects as only 22% and 47% of these projects reported upgrading facilities as an outcome. These are illustrated in Table 49 below.

Contract type	Outcomes for your organisation in participating to FP6 project							
	No survey response	Built European infrastructure	Built European networks	Improved quality of data	Multiple set of outcomes	Research results	Upgraded the facility	Total
Communication network development - coordination action				1			1	**2**
Communication network development - integrated infrastructure initiative					2	2	7	**11**
Construction of new infrastructure	3	1			3		2	**9**
Design study		1			8	1	9	**19**
Integrating activity - coordination action					1		9	**10**
Integrating activity - integrated infrastructure initiative			1		5	3	23	**32**
Total	**3**	**2**	**1**	**1**	**19**	**6**	**51**	**83**

Table 49: Most important outcomes for participating organisations from the RI project by contract type

In order to start to attribute observed outcomes to the FP6 project, respondents were asked whether if the project had not received the Commission funding their organisation would have undertaken the activities it currently does. Very few (7.2%, n = 6) projects were associated with participants who stated that activities would have been undertaken – either in the same way or with a reduced capacity. Over half of projects (56.6%, n = 47) were associated with participants that stated that activities would only have been partly undertaken. For 17 projects (20.5%) respondents associated with the project gave a mixture of answers.

Would activities have been undertaken without FP6 funding?	Frequency	Percent
No survey response	4	4.8
No question response	2	2.4
Mixture	17	20.5
not at all	7	8.4
Partly	47	56.6
yes, but reduced capacity	3	3.6
yes, in the same way	3	3.6
Total	**83**	**100.0**

Table 50: Extent to which activities would have been undertaken without FP6 funding

Respondents were also asked whether they had expanded services as a result of the FP6 project. Over half (55.4%, n = 46) of the projects were associated with respondents who said that projects had expanded as a result of FP6 funding and only a quarter (24.1%, n = 20) with respondents who said that services had not expanded.

Services expanded as a result of the FP6 project	Frequency	Percent
No survey response	3	3.6
No question response	5	6.0
Mixture	9	10.8
No	20	24.1
Yes	46	55.4
Total	**83**	**100.0**

Table 51: Services expanded as a result of the FP6 project

When broken down by scientific domain (Table 52) it can be seen that the expansion of services occurs in higher proportions in project in the following scientific domains:

- In the Socio-economic Sciences and Humanities domain 4 out of 5 projects (80%) have expanded their services.
- In the ICT - e-infrastructures & ICT and Mathematics domain 12 out of 16 projects (75%) have expanded their services.
- In the Physics, Material Sciences and Analytical Facilities domain 7 out of 10 projects (70%) have expanded their services.
- In the Astronomy, Astroparticles and Space Technology domain only 1 out of 11 projects (9%) has expanded its services.

Scientific domain	Have you expended services as a result of FP6 project					
	no survey response	no question response	mixture	no	yes	Total
Astronomy, Astroparticles and Space Technology		1	1	8	1	**11**
Engineering, Energy and Nanotechnologies		1		4	2	**7**
Environment and Earth Sciences	1		3	1	7	**12**
High Energy and Nuclear Physics				3	6	**9**
ICT - e-infrastructures & ICT and Mathematics		1	1	2	12	**16**
Life Sciences and Biotechnologies	1	1	3	1	7	**13**
Physics, Material Sciences and Analytical Facilities		1	1	1	7	**10**
Socio-economic Sciences and Humanities	1				4	**5**
Total	**3**	**5**	**9**	**20**	**46**	**83**

Table 52: Services expanded as a result of the FP6 project by scientific domain

When assessing this against the contract types, it is notable that (refer to Table 53 below):

§ Design studies and construction projects were least likely to have expanded their services as a result of the FP project. Only 26% of design studies and 33% of construction projects reported they had done so.

§ Communication network development projects were most likely to have expanded their services with 100% of coordination action projects and 82% of integrated infrastructure initiative reporting this.

§ From the integrating activity projects, 69% of integrated infrastructure initiatives reported they had expanded services, and 50% of coordination action projects said they had expanded the services.

Contract type	Have you expanded services as a result of FP6 project					
	No survey response	no question response	mixture	no	yes	Total
Communication network development - coordination action					2	**2**
Communication network development - integrated infrastructure initiative			1	1	9	**11**
Construction of new infrastructure	3	1		2	3	**9**
Design study		2	3	9	5	**19**
Integrating activity - coordination action			2	3	5	**10**
Integrating activity - integrated infrastructure initiative		2	3	5	22	**32**
Total	**3**	**5**	**9**	**20**	**46**	**83**

Table 53: Services expanded as a result of the FP6 project by contract type

Further questions were asked about specific types of impact that might have occurred because of the FP6 project. For those projects in which respondents felt that the outcome was relevant and where respondents' answers were not mixed[14], respondents reported that:

- Industry use of the RI was unchanged in 22 projects (26.5%) and increased in use in 11 projects (13.3%). Of these projects where there was an increase 5 were in the Life Sciences and Biotechnologies scientific domain.
- Remote use of the RI increased in 18 projects (21.7%). Of these 9 projects were in the ICT - e-infrastructures & ICT and Mathematics scientific domain. Remote use of the RI was unchanged in 15 projects (18.1%).
- The number of non-European users of the RI was unchanged in 22 projects (26.5%) and increased in 14 projects (16.9%). Of these projects where there was an increase 6 were in the ICT - e-infrastructures & ICT and Mathematics scientific domain.

More detail on each of these potential outcomes is available in Table 54, Table 55 and Table 56 .

Industry use of RI changed as a result of FP6 project	Frequency	Percent
No survey response	3	3.6
No question response	5	6.0
Increased	11	13.3
Mixture	18	21.7
not relevant	24	28.9
Unchanged	22	26.5
Total	**83**	**100.0**

Table 54: Extent to which industry use of the RI changed as a result of the FP6 project

[14] 'Mixed' refers to the situation where the answers from respondents associated with a particular project were not sufficiently consistent with each other to make use of the responses. However, the fact that respondents gave answers that were inconsistent with each other could, itself be worthy of note.

Remote use of RI changed as a result of FP project	Frequency	Percent
No survey response	3	3.6
No question response	5	6.0
Increased	18	21.7
Mixture	24	28.9
not relevant	18	21.7
Unchanged	15	18.1
Total	**83**	**100.0**

Table 55: Extent to which virtual use of the RI changed as a result of the FP6 project

Change in non-European users of RI as a result of FP6 project	Frequency	Percent
No survey response	3	3.6
No question response	6	7.2
Increased	14	16.9
Mixture	22	26.5
not relevant	16	19.3
Unchanged	22	26.5
Total	**83**	**100.0**

Table 56: Extent to which the number of non-European users of the RI changed as a result of the FP6 project

Paths to impact

Respondents were asked whether, at the start of the project, they anticipated that the FP6 project would have various different impacts. For those projects in which respondents felt that the impact was relevant and where respondents' answers were not mixed respondents reported that:

- In 76 (91.6%) of projects they did anticipate impacts on the scientific community.
- In 75 (90.4%) of projects they did anticipate impacts on research infrastructures.
- In 54 (65.1%) of projects they did anticipate impacts on research policy/strategy.

It is interesting to note that 100% of coordination action projects (relating both to communication network development and integrating activity) anticipated impact to research policy strategy. 81% of integrating activity - integrated infrastructure initiative projects, also anticipated this.

However, for two other types of impact respondents (where they felt the impact was relevant and where their answers were not mixed) were more likely not to anticipate that the project would have an impact:

- In 52 (62.7%) of projects respondents did not anticipate economic/industrial impacts.
- In 46 (55.4%) of projects respondents did not anticipate a wider societal impact

In this context it is of interest to note that Communication network development - integrated infrastructure initiative contracts are somewhat different from other projects in these respects. They were most likely to anticipate economic/industrial impacts with 36% of the projects reporting this. Moreover, 45% of these projects also reported that they anticipated wider societal impacts, which contrasts them from the other contract types.

Respondents were asked a number of questions relating to links between the RI project, industry and wider economic impacts.

- Only respondents associated with 6 (7.2%) of projects reported that a commercialisation strategy was in place. A commercialisation strategy was reported as not in place or not relevant in 49 (59.0%) projects.

- Only respondents associated with 8 (9.6) of projects reported that licensing agreements were currently in place. Licensing agreements were reported as not in place or not relevant in 37 (44.6%) projects.
- Only respondents associated with 6 (7.2%) of projects reported that the RI project had already realised joint projects with industry. Respondents associated with a further 21 (25.3%) of projects reported that joint projects with industry were not yet realised and 28 (33.7%) that they were not expected.
- Only respondents associated with 1 (1.2%) of projects reported that the RI project had already realised IPR/patents. Respondents associated with a further 5 (6.0%) of projects reported that IPR/patents were not yet realised and 53 (63.9%) that they were not expected.
- Only respondents associated with 2 (2.4%) of projects reported that the RI project had already realised spin off companies. Respondents associated with a further 5 (6.0%) of projects reported that spin off companies were not yet realised and 62 (74.7%) that they were not expected.
- Only respondents associated with 2 (2.4%) of projects reported that the RI project had already generated new industrial processes. Respondents associated with a further 6 (7.2%) of projects reported that new industrial processes were not yet realised and 56 (67.5%) that they were not expected.

For these questions a relatively large proportion of projects (typically around 20%) were associated with mixed responses, indicating that respondents associated with a particular project gave answers that contradicted each other. This may indicate a degree of uncertainty among respondents in relation to the issues covered by these questions.

Respondents were asked a number of questions about the links between RI projects and wider societal impacts.

- Respondents associated with 60 (70.2%) projects reported that a public dissemination strategy was in place. For all scientific domains the proportion of projects with a strategy in place ranged from 60 to 90 per cent of projects, with the exception of the Astronomy, Astroparticles and Space Technology domain in which only 5 out of 11 (45.4%) projects had a strategy in place. Only respondents associated with 5 (6.0%) projects reported that a strategy was either not in place or not relevant. Respondents associated with 53 (60.9%) projects reported that their RI realised the encouragement of non-commercial use of research resources. A particularly high proportion of projects from three scientific domains were associated with realising the encouragement of non-commercial use of research resources: ICT - e-infrastructures & ICT and Mathematics; Physics, Material Sciences and Analytical Facilities; and Socio-economic Sciences and Humanities. Only respondents associated with 4 projects (4.8%) reported that this outcome was not expected. Communication network development projects were most likely to report that their RI project encouraged non-commercial use of research resources with 100% of coordination action and 82% of integrated infrastructure initiatives reporting this was expected. 78% of integrated infrastructure initiative projects also had already realised non-commercial use of research resources.
- Respondents associated with 29 (34.9%) of projects reported that their RI project had realised the encouragement of increased access to the RI due to the quality of the IT. Only respondents associated with 10 (12.0%) projects reported that this outcome was not expected.
- Respondents associated with 30 (36.1%) reported that that they did not expect their RI project to realise the encouragement of liaison with local communities. Only respondents associated with 16 (19.3%) of projects reported that this outcome was realised. In this respect Communication network development - integrated infrastructure initiative are in contrast to other contract types in that 45% (5 out of 11) of these projects reported that this was already realised.
- Respondents associated with 16 (19.3%) of projects reported that their RI project had realised the encouragement of improvements in the quality of RIs in New Member States. Respondents associated with a further 20 (24.1%) of projects expected this outcome to be realised. Respondents associated with 14 (16.9%) of projects did not expect this outcome to be realised. Of the contract types, integrated infrastructure initiatives (relating to both communication network development and integrating activities) were most likely to have

realised improvements in quality of RI New Member States with 27-28% of projects reporting this.

Impacts

Respondents were asked about impacts relating to:

- the RI;
- the scientific community;
- the research policy;
- industry.

In relation to the impact on the RI, respondents were asked about:

- the number of young researchers (below the age of 35);
- the quality of research data changed; and
- the quality of research infrastructures.

Respondents associated with 48 (57.8%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there was an increase in the number of young researchers (below the age of 35) working in the area of the project at their institution. Of these, respondents associated with 45 (54.2%) of the projects reported that the FP6 RI funding had contributed to this change. There were a particularly high proportion of projects associated with an increase resulting from FP6 funding in the following scientific domains: High Energy and Nuclear Physics; Physics, Material Sciences and Analytical Facilities; and Socio-economic Sciences and Humanities. Of the contract types, design studies (68%), Communication network development - integrated infrastructure initiative (64%) and Integrating activity - integrated infrastructure initiative (59%) projects were most likely to report that FP6 funding had contributed to increase in the number of young researchers.

Respondents associated with 52 (62.7%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), the quality of research data was better. Of these, respondents associated with 51 (61.4%) of the projects reported that the FP6 RI funding had contributed to this change. There were a particularly high proportion of projects associated with better quality data in the following scientific domains: High Energy and Nuclear Physics; and Physics, Material Sciences and Analytical Facilities. Of the contract types Communication network development - coordination action (100%) and Integrating activity - integrated infrastructure initiative (75%) projects were the most likely to report that FP6 RI funding had contributed to better quality research data.

Respondents associated with 56 (67.5%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), the quality of research infrastructure services was better. Of these, respondents associated with 55 (66.3%) of the projects reported that the FP6 RI funding had contributed to this change. There was a particularly high proportion of projects associated with better quality research infrastructure services in the following scientific domains: Environment and Earth Sciences; ICT - e-infrastructures & ICT and Mathematics; Physics, Material Sciences and Analytical Facilities; and Socio-economic Sciences and Humanities. Integrated infrastructure initiative projects (relating to both communication network development and integrated infrastructure initiative) together with Communication network development - coordination action were most likely to report that the quality of RI services was better and that FP6 RI funding had contributed to this change.

In relation to the impact on the scientific community, respondents were asked about:

- the degree to which researchers are networked
- the number of people receiving training in the use of equipment
- the number of integrated data sets

Respondents associated with 67 (80.7%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there had been an increase in the degree to which researchers are networked in the area of science in which the project operates. Of these, respondents associated with 66 (79.5%) of the projects reported that the FP6 RI funding had contributed to this change. There were a high proportion of projects associated with the degree to which researchers are networked in all scientific domains with the exception of Engineering, Energy and Nanotechnologies where the proportion was much lower. With respect to contract types, a high proportion of all contract types reported that researchers are networked in the area of science in which the project operates with the exception of constriction of new infrastructures where the proportion was lower.

Respondents associated with 42 (50.6%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there were more people receiving training in the use of equipment. All of these, respondents reported that the FP6 RI funding had contributed to this change. There were a similar proportion of projects associated with more people receiving training in all scientific domains with the exception of Engineering, Energy and Nanotechnologies where the proportion was much lower. With regards to the contract types, integrated infrastructure initiatives (relating to both communication network development and integrated infrastructure initiative) were most likely to receive training in the use of equipment. For the CND this was the case for 73% of the project s and integrating activity 66% of the projects.

Respondents associated with 35 (42.2%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there were more integrated data sets in the area of science in which the RI operates. Of these, respondents associated with 34 (41.0%) of the projects reported that the FP6 RI funding had contributed to this change. There was a particularly low proportion of projects associated with more integrated data sets in the following scientific domains: Engineering, Energy and Nanotechnologies; and Physics, Material Sciences and Analytical Facilities. With respect to contract types, Communication network development - integrated infrastructure initiative, Construction of new infrastructure and Design study projects had a low proportion of projects reporting increase in the number of integrated data sets in the area of science where the RI operates.

In relation to the impact on research policy, respondents were asked about any change in the priority given to the RI in national research policies.

- Respondents associated with 28 (33.7%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there was no change in the priority given to the RI in national research policies.
- Respondents associated with 21 (25.3%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there was an increase in the priority given to the RI in national research policies. Of these, respondents associated with 17 (20.5%) of the projects reported that the FP6 RI funding had contributed to this change. Five of these projects were in the Physics, Material Sciences and Analytical Facilities scientific domain. In relation to contracts, 6 (32%) design studies, 5 (16%) Integrating activity - integrated infrastructure initiative, 4 (36%) Communication network development - integrated infrastructure initiative and 2 (22%) Construction of new infrastructure project reported that there was an increase in the priority given to the RI in national research policies and that FP6 RI funding had contributed to this change.

In relation to the impact on industry, respondents were asked about change in the level of industry participation in the area of science in which the RI operated.

- Respondents associated with 19 (22.9%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there was no change in the level of industry participation in the area of science in which the RI operated.
- Respondents associated with 19 (22.9%) projects reported that this impact was not relevant to their project.

Respondents associated with only 6 (7.2%) projects reported that, comparing the year before the FP6 RI project started and the end of the project (or now if the project was still ongoing), there was an increase in the level of industry participation in the area of science in which the RI operated. Of these only 4 reported that FP6 RI funding had contributed to this change. Two were from the Engineering, Energy and Nanotechnologies scientific domain and two from the Physics, Material Sciences and Analytical Facilities domain. With respect to contract types, the projects who reported that funding had contributed to increase in industry participation relate to two design studies, one Integrating activity - integrated infrastructure initiative and a construction of new infrastructure.

Views of project coordinators

Project coordinators have additional insight into the RI projects and so were asked some additional questions. Project coordinators responded for 54 projects.

Project coordinators were asked whether the RI project included the most relevant participants. For 49 out of 54 projects (90.7%) they reported that the most relevant participants were included. Only 2 projects (3.7%) reported that the most relevant participants were not included.

Project coordinators were also asked whether the RI project had met its objectives. For 40 out of 54(74.1%) coordinators reported that the project had either met or exceeded its objectives. Only 5 out of 54 (9.3%) reported that the project had not met its objectives. Table 57 breaks this down by scientific domain. This table shows that there is considerable variation in the proportion of projects in different scientific domains for which coordinators reported that they achieved their objectives. For example, 8 out 10 (80%) of projects in the Physics, Material Sciences and Analytical Facilities domain achieved or exceeded their objectives, compared to 3 out of 12 (25%) in the Environment and Earth Sciences domain.

Scientific domain	To what extent do you think that the project has achieved its objectives?					
	No survey response	No question response	Exceeded	Fully	Partially	Total
Astronomy, Astroparticles and Space Technology	2		2	4	3	**11**
Engineering, Energy and Nanotechnologies	2	1		3	1	**7**
Environment and Earth Sciences	6	2	1	2	1	**12**
High Energy and Nuclear Physics	3		4	2		**9**
ICT - e-infrastructures & ICT and Mathematics	7		3	4	2	**16**
Life Sciences and Biotechnologies	7	1	1	3	1	**13**
Physics, Material Sciences and Analytical Facilities	1	1	2	6		**10**
Socio-economic Sciences and Humanities	1		1	2	1	**5**
Total	**29**	**5**	**14**	**26**	**9**	**83**

Table 57: Did the RI project meet its objectives by scientific domain

The views of project coordinators were also sought on project funding provided by the EC in relation to the needs of scientific communities and in relation to the project's goals.

- 28 out of 54 (51.8%) reported that funding in relation to the needs of scientific communities was adequate and 1 project that it was fully adequate. Sixteen out of 54 (29.6%) reported that it was inadequate.
- 33 out of 54 (61.1%) reported that funding in relation to the project goals was adequate with a further 3 projects (5.5%) reporting that it was fully adequate. Only 9out of 54 (16.6%) reported that it was inadequate.

Furthermore, there was variation in the proportion of projects across contract types for which coordinators reported that they achieved their objectives. For example, Table 58 below shows that

100% of (2 out of 2) Communication network development - coordination action projects and 66% (21 out of 32) Integrating activity - integrated infrastructure initiative projects had either fully met their objectives or the objectives were exceeded. In contrast, none of the construction projects and 30% (3 out of 10) Integrating activity - coordination action had either fully met their objectives or the objectives were exceeded.

Contract type	To what extent do you think the project has achieved its objectives?					
	No survey response	No question response	Exceeded	Fully	Partially	Total
Communication network development - coordination action			1	1		**2**
Communication network development - integrated infrastructure initiative	6		2	2	1	**11**
Construction of new infrastructure	6	1			2	**9**
Design study	6	2	3	7	1	**19**
Integrating activity - coordination action	4			3	3	**10**
Integrating activity - integrated infrastructure initiative	7	2	8	13	2	**32**
Total	**29**	**5**	**14**	**26**	**9**	**83**

Table 58: Did the RI project meet its objectives by contract type

Project coordinators were asked about the appropriateness of the EC contract conditions for achieving the objectives of the project and their views on the non-financial support/other inputs from EC programme staff.

- 22 out of 54 (40.7%) reported that contract conditions were appropriate.
- 21 out of 54 (38.8%) reported that contract conditions were acceptable but could be improved.
- 27 out or 54 (50.0%) reported that support from programme staff was acceptable.
- 16 out of 54 (29.6%) reported that support from programme staff was excellent.

Project coordinators were asked to identify whether the number of users had changed between the year before the project and the current time. 'Users' were defined as those external to participating organisations. Coordinators reported that across the 54 projects:

- Currently, the number of virtual organisational users was 6,012 with a mean number of 501 users per project. The year before the programme started there had been no virtual organisational users. These numbers relate to the 12 projects that provided a response regarding to virtual organisational users. These figures include a big range of users including some fairly large outliers. For instance, 3 single projects with the largest numbers of users (ranging from 300 to 5,000) were from the following scientific domains: ICT - e-infrastructures & ICT and Mathematics; Life Sciences and Biotechnologies; and Physics, Material Sciences and Analytical Facilities.
- The number of physical organisational users was 1,962 with a mean number of users of 72.6 per project. In the year prior to the project there were 410 users relating to 7 projects with a mean number of users of 58.6 per project. These numbers relate to the 27 projects that provided a response regarding physical organisational users. The 4 single projects with the largest numbers of users (ranging from 150 to 600) were in the following scientific domains: Life Sciences and Biotechnologies; and Physics, Material Sciences and Analytical Facilities.

- The number of virtual individual users was 24,175, relating to the 16 projects that responded, with a mean number of users of 1,510 per project. This represents an increase on the situation the year before the programme started when there were 1,024 users with a mean number of users of 40.9 per project relating to 25 respondent projects. The 5 single projects with the largest numbers of users (ranging from 800 to 15,000) were in the following scientific domains: Astronomy, Astroparticles and Space Technology; Physics, Material Sciences and Analytical Facilities; and Socio-economic Sciences and Humanities.
- The number of physical, individual users was 30,074, relating to 27 respondent projects, with a mean number of users of 1113.9 per project. This represents an increase on the situation the year before the programme started when there were 8,965 users with a mean number of users of 597.6 per project relating to 15 respondent projects. The 2 single projects with the largest numbers of users (5,000 and 20,000 respectively were both in the Physics, Material Sciences and Analytical Facilities scientific domain.

As the wide ranges of users for all categories shows, the figures set out above tend to be skewed by a few projects with large numbers of users and thus must be treated with caution.

Appendix D – Findings from case studies

This section describes the finding from the descriptive analysis based on the data gathered via interviews during the case study exercise. These results should be reflective of the of the total project population, given that the case studies were selected via a random sample.

Please note that the opinions expressed in this analysis relate to views of the members of the coordinating organisation interviewed during the field visit.

Description of case study projects

The case study projects covered a broad range of research areas. These are set out in Table 59 and compared to similar data gathered during the Project survey of all 83 projects. As can be seen, the profiles of case study project research areas are similar to the profile for all the 83 projects. Table 60 shows the spread of projects by instrument. Evidently there is a good spread of research areas across the different instruments.

Research area	Case study sites		All projects	
	Frequency	Percent	Frequency	Percent
Astronomy, Astroparticles and Space Technology	3	10.0	11	13.3
Engineering, Energy and Nanotechnologies	2	6.7	7	8.4
Environment and Earth Sciences	4	13.3	12	14.5
High Energy and Nuclear Physics	3	10.0	9	10.8
ICT - e-infrastructures	6	20.0	16	19.3
Life Sciences and Biotechnologies	6	20.0	13	15.7
Physics, Material Sciences and Analytical Facilities	5	16.7	10	12.0
Socio-economic Sciences and Humanities	1	3.3	5	6.0
Total	**30**	**100.0**	**83**	**100.0**

Table 59: Case study research areas compared to all projects

Research area	Project Instrument			
	CA	I3	SSA	Total
Astronomy, Astroparticles and Space Technology	1	0	2	3
Engineering, Energy and Nanotechnologies	0	1	1	2
Environment and Earth Sciences	0	2	2	4
High Energy and Nuclear Physics	0	3	0	3
ICT - e-infrastructures	0	6	0	6
Life Sciences and Biotechnologies	1	1	4	6
Physics, Material Sciences and Analytical Facilities	1	3	1	5
Socio-economic Sciences and Humanities	0	1	0	1
Total	**3**	**17**	**10**	**30**

Table 60: Case study research areas broken down by project instrument

Table 61 provides a breakdown of scheme type for the 30 case study projects, compared to all 83 projects. Of the case study sites 14 (46.7%) were Integrating Activity projects, 7 (23.3%) were Design Studies, 6 (20.0%) were Communication Network Development projects and 3 were Construction of New Infrastructure projects. As can be seen in, this is a similar profile to that generated for all 83 projects from data gathered for the project survey undertaken earlier in the evaluation.

Scheme type	Case study sites		All projects	
	Frequency	Percent	Frequency	Percent
Communication network development	6	20.0	13	15.7
Construction of new infrastructure	3	10.0	9	10.8
Design study	7	23.3	19	22.9
Integrating activity	14	46.7	42	50.6
Total	**30**	**100.0**	**83**	**100.0**

Table 61: Scheme type for case study sites compared to all projects

Table 62 provides a breakdown of instrument type for the 30 case study projects, compared to all 83 projects. Of the 30 projects, 17 (56.7%) were Integrated Infrastructure Initiatives, 10 (33.3%) were Specific Support Actions and 3 (10.0%) were Co-ordination Actions. This is similar to the profile of all 83 projects, with the caveat that I3 projects are overrepresented by about 5% and CA projects underrepresented by about 5%.

Instrument	Case study sites		All projects	
	Frequency	Percent	Frequency	Percent
Co-ordination Actions	3	10.0	12	14.5
Integrated Infrastructure Initiatives	17	56.7	43	51.8
Specific Support Actions	10	33.3	28	33.7
Total	**30**	**100.0**	**83**	**100.0**

Table 62: Instrument type for case study sites compared to all projects

Finally, Table 63 provides a breakdown of contract types and project instruments.

Contract type	Project Instrument			
	CA	I3	SSA	Total
Communication network development - Integrated Infrastructure Initiative	0	6	0	6
Construction of New Infrastructure	0	0	3	3
Design study	0	0	7	7
Integrating activity - Coordination Action	3	0	0	3
Integrating activity - Integrated Infrastructure Initiative	0	11	0	11
Total	**3**	**17**	**10**	**30**

Table 63: Case study projects broken down by contract type and research instrument

Project coordinators were asked about their project's progress towards completion. Their answers are set out in Table 64. The majority of projects (n = 21, 70.0%) were either complete or between 75 – 99 percent complete. This is consistent with the survey of all 83 projects undertaken by the evaluation team at an earlier stage in the evaluation[15] which found that 69.9% of projects were either complete or between 75 – 99 percent complete. A disproportionate number of projects between 25 and 74 percent complete were I3 projects. Of the 9 projects between 25 and 74 percent complete 77.7% (n = 7) were I3 projects compared to 56.7% of the overall sample.

Progress towards completion	Frequency	Percent
25-49%	4	13.3
50-74%	5	16.7
75-99%	9	30.0
Complete[16]	12	40.0
Total	**30**	**100.0**

Table 64: Project progress towards completion

[15] See Project Survey Report for more details.

[16] 4 of these were completed before 2008 and 8 are or will be completed by end of 2008.

Operational context

Project rationale

Case studies coordinators were asked about the nature of the need which the project was set up meet (See Table 65). For the majority (n = 20, 66.7%) the project was intended to meet a scientific need. Some (n = 6, 20.0%) projects were a response to the needs of RIs and for a few (n = 4, 13.3%) other types of need were being met including societal needs or the needs of particular groups of users. One hundred percent of CA projects (n = 3) were intended to meet scientific need compared to 70.0% of SSA projects (n = 7) and 58.8% (n = 10) of I3 projects.

The majority of project coordinators (n = 18, 60.0%) described the involvement of stakeholders in the process of defining needs as ‘strong’. For I3 projects 70.6% (n = 12) were described as strong, compared to 50.0% (n = 12) of SSA projects and 33.3% (n = 1) of CA projects. Five (16.7%) project coordinators described stakeholder involvement as weak or said there wasn’t any.

Nature of need	Frequency	Percent
Need relating to RIs	6	20.0
Other need e.g. societal, user needs	4	13.3
Scientific need	20	66.7
Total	**30**	**100.0**

Table 65: The nature of need the project was set up to meet

Coordinators were also asked what their organisation’s main need or rationale was for taking part in the FP6 project. Ten (33.3%) participated in order to ‘internationalise’ and 4 (13.3%) to attract funding. The other 16 projects had other reasons for taking part.

Project objectives

The main objective for 50.0% (n = 15) of projects was to enable international networking, integration, learning or access. The next most common objective (n =11, 36.7%) was to develop international structures, standards, protocols or data sets. These results are set out in Table 66. The small number of projects reporting new partners (see below) suggests that these objectives were restricted primarily to potential users and the wider scientific community rather than to the engagement of partners.

When the fifteen projects reporting their main objective as enabling international networking, integration, learning of access are examined according to instrument, the proportion of projects reporting this objective was higher for CA projects (66.7%, n = 2) and I3 projects (64.7%, n = 11) but lower for SSA projects (20.0%, n = 2).

Main objectives of the FP6 project	Frequency	Percent
Develop international structures/standards/protocols/data sets	11	36.7
Enable international networking/integration/learning/access, other	15	50.0
Other	4	13.3
Total	**30**	**100.0**

Table 66: Main objectives of the FP6 project

Project coordinators were asked to assess how well the FP6 project objectives fitted within the broader objectives of the RI and their own organisation (see Table 67). Twenty (66.7%) reported that there was an excellent fit with all objectives aligned. Only 2 coordinators (6.7 %) reported a poor fit where objectives were either different to that of the RI and/or their own organisation or where there were competing objectives. Of the 20 projects reporting an excellent fit, SSA projects reported a higher than average fit (80.0% of SSA projects, n = 8) and CA projects a lower than average fit (33.3% of CA projects, n = 1).

How well did FP6 objectives fit?	Frequency	Percent
Excellent fit (all objectives aligned)	20	66.7
Partial fit (some shared objectives)	8	26.7
Poor fit (separate or competing objectives)	2	6.7
Total	**30**	**100.0**

Table 67: How well did FP6 objectives fit with the broader objectives of the RI and the coordinator's organisation?

Nature of the projects

Project coordinators were asked what types of RI form part of the FP6 project. Table 68 shows the categories of RI that project coordinators reported. Numbers exceed 30 because some project coordinators reported more than one RI as forming part of their project. The most common type of RI associated with FP6 projects were single-site RIs (n = 18, 50.0%). A disproportionately large number of I3 projects contained single-site RIs. Of the 18 projects that included single-site RIs, 13 (72.2%) were I3 projects, although only 56.7% of the case study sample were I3 projects.

Type of RI	Frequency	Percent
Multi-site	8	22.2
Single-site	18	50.0
Virtual Multi-site	10	27.8
Total	**36**	**100.0**

Table 68: Types of RI associated with the FP6 project

The age of RIs associated with the FP6 project ranged from 2.5 to 108 years. Table 69 provides a summary of RI age. Almost half of RIs (n = 14, 46.7%) were less than 20 years old. This information is further broken down by project instrument in Table 70 which shows that there is a good spread of RI ages across the three types of project instrument.

Age of RI	Frequency	Percent
Uncodable data	4	13.3
1-10 years	8	26.7
11-20 years	6	20.0
21-30 years	3	10.0
More than 30 years	4	13.3
Not applicable	5	16.7
Total	**30**	**100.0**

Table 69: Summary of age of RIs associated with the FP6 project

Age of RI	Project Instrument			
	CA	I3	SSA	Total
Uncodable data	1	2	1	4
1-10 years	0	6	2	8
11-20 years	2	3	1	6
21-30 years	0	3	0	3
More than 30 years	0	2	2	4
Not applicable	0	1	4	5
Total	**3**	**17**	**10**	**30**

Table 70: Summary of age of RIs associated with the FP6 project broken down by project instrument

Project participants

The number of participants involved in the case study projects varied widely. Table 71 shows information provided by project coordinators on number of project participants. Eleven projects (36.7%) had between 1 and 10 participants, 8 projects (26.7%) had between 11 and 20 and 6 (20.0%) had between 21 and 30. Fewer projects had larger numbers of participants. A breakdown of this information by project instrument is provided in Table 72. A disproportionately large number of projects with a smaller number of participants were SSA project instruments. Of 11 projects with between 1 and 10 participants 81.8% (n = 9) were SSA projects. By contrast a disproportionately large number of the projects with a larger number of participants were I3 projects.

No. of participants	Frequency	Percent
1-10	11	36.7
11-20	8	26.7
21-30	6	20.0
31-40	3	10.0
More than 40	2	6.7
Total	**30**	**100.0**

Table 71: Number of participants involved in each case study

Number of participants		Project Instrument			
		CA	I3	SSA	Total
1-10	Count	0	2	9	11
	Percent	0.0%	18.2%	81.8%	100.0%
11-20	Count	1	6	1	8
	Percent	12.5%	75.0%	12.5%	100.0%
21-30	Count	1	5	0	6
	Percent	16.7%	83.3%	0.0%	100.0%
31-40	Count	1	2	0	3
	Percent	33.3%	66.7%	0.0%	100.0%
More than 40	Count	0	2	0	2
	Percent	0.0%	100.0%	0.0%	100.0%
Total	**Count**	**3**	**17**	**10**	**30**
	Percent	**10.0%**	**56.7%**	**33.3%**	**100.0%**

Table 72: Number of participants involved in each case study broken down by project instrument

Project coordinators from the vast majority of FP6 projects (n = 27, 90.0%) reported that they had worked previously with some or most partners. Only two (6.7%) of FP6 projects involved new partners and these were both I3 projects. This is described in Table 73 below.

History of collaboration with partners	Frequency	Percent
All new partners	2	6.7
Worked previously with most partners	17	56.7
Worked previously with some partners	10	33.3
Not applicable	1	3.3
Total	**30**	**100.0**

Table 73: History of collaboration with partners

The rationale for selecting project partners (participants), as described by project coordinators, is set out in Table 74 . For the majority of projects (n = 18, 60.0%) project partners with the best expertise were selected. For four (13.3%) projects, geographic spread was the main rationale for partner selection. These four were all I3 projects.

Rationale for selection of project partners	Frequency	Percent
Geographic spread to meet criteria	4	13.3
Picking groups with best expertise	18	60.0
Other	5	16.7
Not applicable	3	10.0
Total	**30**	**100.0**

Table 74: Rationale for selection of project participants

Where partners from new member states were involved in the FP6 project, coordinators were asked why they were selected. Of the 21 (70.0%) projects where they had NMS partners, 11 (52.3% of relevant projects) reported that it was because they were the best partners. Ten out of these 11 (90.9%) were I3 projects.

Project coordinators were also asked about the reasons for involving partners from industry. Of the 14 (46.6%) from projects where this was relevant, 9 (64.2% of relevant projects) reported that it was because the industry partner was the best partner to deliver the project's needs. Of these 9, 77.8% (n = 7) were I3 projects.

Fourteen (46.7%) of project coordinators reported that their project involved additional, non-funded partners. Table 75 shows the location of these partners. Eight (57.1% of relevant projects) were from EU Member States, two (14.3% of relevant projects) were from other European countries and four (28.6% of relevant projects) were from non-European countries. Three of the four projects (75.0%) with participants from non-European countries were I3 projects. In 9 of the 14 projects with additional, non-funded partners (64.3% of relevant projects) the role of the additional partners was to make a specific contribution. In 4 of these projects (28.6% of relevant projects) the additional partners took part in the same was as other, funded partners. All of these four projects were I3 projects.

Location of additional, non-funded partners	Frequency	Percent
EU MS	8	26.7
Non-European	4	13.3
Other Europe	2	6.7
Not applicable	16	53.3
Total	**30**	**100.0**

Table 75: location of additional, non-funded partners

Project activities

The majority of project coordinators (n = 24, 80.0%) reported no change in the activities from those that were originally planned. Four (13.3%) reported that more activities were undertaken than planned.

Project outcomes

Project coordinators were asked a number of questions about the outcomes that have been generated by their projects, as well as longer-term outcomes that might be generated in the future.

When asked what the main outcomes generated by the FP6 project were for the RI, partners and their own organisation, the most common answer (n = 13, 43.3%) was the development of new of better European structures or facilities. The development of new of improved European networks (n = 6, 20.0%) and the development of new or improved access to European facilities (n = 4, 13.3%) were the next most common answers. Results are set out in Table 76 and are further broken down by project instrument in Table 77. It is noticeable that:

- I3 projects were the only type of project that reported 'new or improved access to European facilities' as their main project outcome
- I3 projects were over-represented amongst projects reporting 'new or better European structures/facilities' as their main outcome

- No CA projects reported 'new or better European structures/facilities' as their main outcome.

Main project outcomes for the RI, partners and coordinator's organisation	Frequency	Percent
New or better European structures/facilities	13	43.3
New or improved access to European facilities	4	13.3
New or improved European networks	6	20.0
Not applicable	1	3.3
Other	6	20.0
Total	**30**	**100.0**

Table 76: Main project outcomes for the RI, partners and the coordinator's organisation

Main project outcomes for the RI, partners and coordinator's organisation		Project Instrument			
		CA	I3	SSA	Total
New or better European structures/facilities	Count	0	8	5	13
	Percent	.0%	61.5%	38.5%	100.0%
New or improved European networks	Count	2	2	2	6
	Percent	33.3%	33.3%	33.3%	100.0%
New or improved access to European facilities	Count	0	4	0	4
	Percent	.0%	100.0%	.0%	100.0%
Other	Count	1	2	3	6
	Percent	16.7%	33.3%	50.0%	100.0%
Not applicable	Count	0	1	0	1
	Percent	.0%	100.0%	.0%	100.0%
Total	Count	3	17	10	30
	Percent	10.0%	56.7%	33.3%	100.0%

Table 77: Main project outcomes for the RI, partners and the coordinator's organisation broken down by research instrument

Broader, longer-term outcomes

Project coordinators were asked two questions about broader, longer-term impacts. These were defined as impacts beyond the immediate science field and the examples given were impacts on wider society or the economy. Coordinators gave a wide range of answers. These were analysed by the evaluation team and ten classifications were identified. Coordinators' responses were then coded using these classifications. Table 78 provides a summary of answers given. Some project coordinators identified more than one outcome so the number of responses is greater than 30. The most commonly identified broader, longer-term outcome (n = 17, 30.4%) was 'answering broader, scientific questions, including contributions to adjacent scientific fields'. This was followed by 'making new data available to users' (n = 10, 17.9%) and 'closer links between science and industry' (n = 9, 16.1%). It is noticeable that, despite being prompted to consider outcomes that might relate to broader society and the economy, most coordinators responded by identifying outcomes that could be summarised as broader, longer-term outcomes for science.

Broader, longer-term outcomes identified	Total	Percent
Answering broader scientific questions, including contributions to adjacent scientific fields	17	30.4
Better of organisation of EU research (structuring effects)	4	7.1
Closer links between science and industry	9	16.1
Development of new standards and protocols	2	3.6
Encouraging more routine collaboration among users	2	3.6
Greater engagement of policy makers in science	3	5.4
Greater engagement of the public in science	3	5.4
Making new data available to users	10	17.9
Raising the profile of European research in relation to rest of the world	4	7.1
The development of new RI projects	2	3.6
Total	**56**	**100.0**

Table 78: Broader, longer-term outcomes identified

In Table 79 the same information is broken down according to project instrument. Compared to the results for all 30 case studies it is noticeable that:

- A higher than average proportion of SSA projects identified 'answering broader scientific questions including contributions to adjacent scientific fields' as an outcome
- A higher than average proportion of CA projects identified 'closer links between science and industry' as an outcome
- A higher than average proportion of SSA projects identified 'making new data available to users' as an outcome

Broader, longer-term outcomes identified		Project Instrument			
		CA	I3	SSA	Total
Answering broader scientific questions including contributions to adjacent scientific fields	Count	0	8	9	17
	Percent within specific long-term outcome	.0%	47.1%	52.9%	100.0%
	Percent of project instrument	.0%	24.2%	50.0%	30.4%
Better of organisation of EU research (structuring effects)	Count	1	3	0	4
	Percent within specific long-term outcome	25.0%	75.0%	.0%	100.0%
	Percent of project instrument	20.0%	9.1%	.0%	7.1%
Closer links between science and industry	Count	2	5	2	9
	Percent within specific long-term outcome	22.2%	55.6%	22.2%	100.0%
	Percent of project instrument	40.0%	15.2%	11.1%	16.1%
Development of new	Count	1	1	0	2

Broader, longer-term outcomes identified		Project Instrument			
		CA	I3	SSA	Total
standards and protocols	Percent within specific long-term outcome	50.0%	50.0%	.0%	100.0%
	Percent of project instrument	20.0%	3.0%	.0%	3.6%
Engaging new groups of users	Count	0	1	0	1
	Percent within specific long-term outcome	.0%	100.0%	.0%	100.0%
	Percent of project instrument	.0%	3.0%	.0%	1.8%
Encouraging more routine collaboration among users	Count	0	1	0	1
	Percent within specific long-term outcome	.0%	100.0%	.0%	100.0%
	Percent of project instrument	.0%	3.0%	.0%	1.8%
Greater engagement of policy makers in science	Count	0	2	1	3
	Percent within specific long-term outcome	.0%	66.7%	33.3%	100.0%
	Percent of project instrument	.0%	6.1%	5.6%	5.4%
Greater engagement of the public in science	Count	1	2	0	3
	Percent within specific long-term outcome	33.3%	66.7%	.0%	100.0%
	Percent of project instrument	20.0%	6.1%	.0%	5.4%
Making new data available to users	Count	0	5	5	10
	Percent within specific long-term outcome	.0%	50.0%	50.0%	100.0%
	Percent of project instrument	.0%	15.2%	27.8%	17.9%
Raising the profile of European research in relation to rest of the world	Count	0	3	1	4
	Percent within specific long-term outcome	.0%	75.0%	25.0%	100.0%
	Percent of project instrument	.0%	9.1%	5.6%	7.1%
The development of new RI projects	Count	0	2	0	2
	Percent within specific long-term outcome	.0%	100.0%	.0%	100.0%
	Percent of project instrument	.0%	6.1%	.0%	3.6%
Total	**Count**	**5**	**33**	**18**	**56**
	Percent within specific long-term outcome	**8.9%**	**58.9%**	**32.1%**	**100.0%**
	Percent of project instrument	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 79: Broader, longer-term outcomes identified broken down by project instrument

For broader, longer-term outcomes project coordinators were asked to estimate the timescale over which these impacts might be realised. There answers are summarised in Table 80. Ten project coordinators (33.3%) responded that these impacts would be realised within 5 years and over half (n = 18, 60.0%) thought they would be realised within 10 years. When the timescale envisaged for impact was analysed by project instrument findings were consistent with those for all 30 case studies.

Time scale envisaged for impacts	Frequency	Percent
Within 5 years	10	33.3
Within 5-10 years	8	26.7
More than 10 years	4	13.3
Not applicable	8	26.7
Total	**30**	**100.0**

Table 80: Timescale envisaged for broader, longer-term impacts to be realised

Direct and indirect beneficiaries

To gain further insight into project outcomes, coordinators were asked to define direct and indirect beneficiaries of the outputs from the FP6 project. Coordinators gave a number of answers. These were analysed by the evaluation team and classifications of beneficiary were identified. Coordinators' responses were then coded using these classifications. Table 81 and Table 82 provide a summary of answers given in relation to direct and indirect beneficiaries. Some project coordinators identified more than one group of beneficiaries so the number of responses is greater than 30. Research users of RIs were the most common type of direct beneficiary (n = 22, 47.8%). The public were the most common type of indirect beneficiary (n = 9, 28.1%), followed by policy-makers (n = 6, 18.8%).

The two projects with direct industry users were both SSA projects, whereas the 5 projects with indirect industry users were all I3 projects.

Direct beneficiaries	Frequency	Percentage
Industry	2	4.3
Participants in the RI consortia	5	10.9
Policy makers	1	2.2
Scientists from the same discipline but from outside Europe	8	17.4
Scientists in other scientific disciplines	8	17.4
Research users of RIs	22	47.8
Total	**46**	**100**

Table 81: Direct beneficiaries of the outputs from the FP6 projects

Indirect beneficiaries	Frequency	Percent
Industry	5	15.6
Participants in the RI consortia	2	6.3
Policy makers	6	18.8
Research users of RIs	2	6.3
Scientists from the same discipline but from outside Europe	3	9.4
Scientists in other scientific disciplines	5	15.6
The public	9	28.1
Total	**32**	**100**

Table 82: Indirect beneficiaries of the outputs from the FP6 projects

Contribution to the reinforcement of ERA

Project coordinators were asked how their project contributed to the reinforcement of the European Research Area. A range of responses were given. Some coordinators gave more than one answer. These were analysed by the evaluation team and classifications were identified. Coordinators' responses were then coded using these classifications. Table 83 shows the result of this analysis. The most common contribution identified was 'structuring the scientific community' (n = 23, 46.9%), followed by 'Fostering coordination of research policies' (n = 10, 20.4%) and 'mobility: increasing mobility of researchers, reinforcing geographical mobility' (n = 9, 18.4%). An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Contribution to reinforcement of ERA	Frequency	Percent
Making research area more attractive to researchers	6	12.2
Fostering coordination of research policies	10	20.4
Mobility: increasing mobility of researchers, reinforcing geographical mobility	9	18.4
Structuring the Scientific Community	23	46.9
The project allowed European organisations to work together to develop a complex infrastructure.	1	2.0
Total	**49**	**100.0**

Table 83: How did FP6 projects contribute to the reinforcement of the ERA?

In the sections below, more detailed analysis is provided on different types of impacts that have been achieved by the FP6 projects.

Impacts on science communities

End-users

During case study fieldwork the impact of the FP6 project on end-users was explored. Project coordinators were asked whether the FP6 RI project enabled end-users to undertake research more quickly, to a higher quality or to undertaken completely new research. The strength of the evidence they provided to support their responses was also assessed.

Research coordinators were asked about the impact of the FP6 project on inter-disciplinary research. The strength of the evidence they provided to support their responses was also assessed and the evaluation team's assessment of impact is set out in Table 84. This shows that there was some evidence of impact in 14 (46.7%) of the projects with evidence of a strong impact in 3 projects (10.0%). An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Level of impact	Frequency	Percent
Evidence of strong impact	3	10.0
Some evidence of impact	14	46.7
No evidence of impact	7	23.3
Not applicable	6	20.0
Total	**30**	**100.0**

Table 84: Evaluation team's assessment of impact of FP6 projects on inter-disciplinary research

To what extent have FP6 projects enabled national RIs in Europe to open up to other European and international users? In order to explore this issue the evaluation team sought evidence such as the expansion of an RI's user base or increased participation by overseas researchers. The strength of the evidence provided to support the project coordinators' responses was also assessed. Results of this analysis are set out in Table 85 . There was strong evidence of a link between the FP6 project and national RIs opening up to other European and international users in 14 (46.7%) projects, of these, 13 were I3 projects. There was weak evidence or no evidence in 11 (36.6%) of the projects. There was no evidence for any of the CA projects (n = 3).

Evidence of a link	Frequency	Percent
Strong evidence of link	14	46.7
Weak evidence of link	4	13.3
No evidence of link	7	23.3
Not applicable	5	16.7
Total	**30**	**100.0**

Table 85: Evaluation team's assessment of the extent to which FP6 projects enable national RIs in Europe to open up to other European and international users

The impact of the FP6 projects on access to critically important equipment was also examined. The impact of increasing access for project participants was relevant to 20 (66.6%) projects. Of these projects 12 (40.0% of projects) reported a high impact on increased access for project participants. These results are shown in

Table 86. The proportion of I3 projects reporting a high impact was higher (52.9% of I3 projects, n = 9). The impact of increasing access for external users was relevant to 19 (63.3%) projects. Of these projects 15 (50.0% of projects) reported a high impact on increasing access for external

users. These results are shown in Table 87. Again, the proportion of I3 projects reporting a high impact was higher (76.5% of I3 projects, n = 13).

Access to project participants	Frequency	Percent
High	12	40.0
Low	5	16.7
Medium	3	10.0
Not applicable	10	33.3
Total	**30**	**100.0**

Table 86: Impact of FP6 projects on increasing access to critically important equipment for project participants

Access to external users	Frequency	Percent
High	15	50.0
Low	4	13.3
Not applicable	11	36.7
Total	**30**	**100.0**

Table 87: Impact of FP6 projects on increasing access to critically important equipment for external users

Training new users

Training will be one factor that influences user access. Project coordinators reported that of the 23 (76.6%) projects for whom user training was applicable 18 of those projects (60.0%) targeted the scientific community for training. A high proportion of these were I3 projects. Fourteen of the 18 projects were I3 projects, meaning that targeting scientific communities for training was an activity undertaken by 82.3% of I3 projects.

Project coordinators were also asked what the main outcome of this training was. The most common answer (n = 14, 46.7%) was 'increased access to services or facilities'.

Many projects also report opening up RI facilities to new user communities. This data is summarised in Table 88. Eight (26.7%) of the projects had opened up RI facilities to user groups from scientific communities that had not previously used the RI facilities ('communities from new scientific disciplines'). All were I3 projects. Seven (23.3%) reported opening facilities to geographical user groups who had not previously accessed the RI facilities ('new geographical user communities'). All but one were I3 projects.

Groups of new user communities	Frequency	Percent
No	2	6.7
Not applicable	13	43.3
opening up to new geographical user communities	7	23.3
opening up to user communities from new scientific disciplines	8	26.7
Total	**30**	**100.0**

Table 88: New communities of users that the FP6 project has opened up RI facilities to

Standing and visibility of European RIs and research

The extent to which the FP6 projects have impacted upon the standing of European RIs compared to those outside Europe and the extent to which the FP6 projects have impacted upon the standing of European research compared to that outside Europe were both examined during case study fieldwork. In both cases the strength of the evidence provided to support the project coordinators' responses was also assessed. The results of this analysis are set out in Table 89 and Table 90. There are similar findings for both types of impact. Twenty one (70.0%) FP6 projects had a strong level of impact on the standing of European RIs and twenty (66.7%) had a strong impact on the standing of European research. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Level of impact	Frequency	Percent
Strong	21	70.0
Weak	3	10.0
No change	4	13.3
Not applicable	2	6.7
Total	**30**	**100.0**

Table 89: Evaluation team's assessment of impact of FP6 projects on the standing of European RIs compared to those outside Europe

Level of impact	Frequency	Percent
Strong	20	66.7
Weak	6	20.0
No change	1	3.3
Not applicable	3	10.0
Total	**30**	**100.0**

Table 90: Evaluation team's assessment of impact of FP6 projects on the standing of European research compared to that outside Europe

Attraction, retention and repatriation of scientists and researchers

Coordinators were asked whether the FP6 project had improved the visibility of their organisation outside of Europe. The strength of the evidence provided to support the project coordinators' responses was also assessed. Fifteen (50.0%) projects reported that the FP6 project had no impact or a weak impact on the visibility of their organisation. Fourteen (46.7%) projects reported that the FP6 project had improved the visibility of their organisation. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

The attraction and retention of researchers is an important issue for the European Commission and for national policy-makers. During the case studies the evaluation team examined various aspects of attraction and retention. While some qualitative and largely anecdotal evidence of attraction and retention was gathered, insufficient evidence was available for quantitative analysis. The issue of repatriation (attracting back expatriate scientists) was also investigated. Coordinators were asked whether the FP6 project had allowed their organisation or organisations participating in the FP6 project as partners to attract back expatriate scientists or researchers. The strength of the evidence provided to support the project coordinators' responses was also assessed. Six projects reported that this issue was not applicable to them. Of the remaining 24 projects, 15 (50.0%) provided no evidence of having repatriated scientists or researchers and 9 (30%) provided some evidence of an FP6 project having an impact on repatriation. Of these 9 projects, 8 were I3 projects.

Generation and improvement of data sets, standards and protocols

The number of new data sets generated and existing data sets improved was examined during field research at the case study sites. The analysis is set out in Table 91 and Table 92. It suggests that generating new data sets was not applicable to almost half of projects (n = 13, 46.7%). Where it was applicable 8 (26.7%) projects had not generated any new data sets at the time the field research was undertaken. Similarly, for 17 projects (60.0%) improving existing data sets was not relevant and for those where it was relevant 8 (26.7%) had not improved any existing data sets at the time the field research was undertaken. Some projects[17] were still operational when the field research was undertaken so might have been planning to generate new data sets or improve existing ones in the future. The relatively small number of projects for whom the generation and improvement of data sets was relevant meant that discerning patterns within the data when it was broken down by project instrument was not possible.

Number of data sets generated	Frequency	Percent
Applicable, but not yet completed	8	26.7
1-5	3	10.0
11-15	1	3.3
16-20	1	3.3
6-10	1	3.3
More than 20	3	6.7
Not applicable	13	46.7
Total	**30**	**100.0**

Table 91: Number of new data sets generated by FP6 projects

Number of existing data sets improved	Frequency	Percent
Applicable, but not yet completed	8	26.7
1-5	2	6.7
16-20	1	3.3
More than 20	2	3.3
Not applicable/no data available	17	60.0
Total	**30**	**100.0**

Table 92: Number of existing data sets improved by FP6 projects

Project coordinators were also asked about the use of data sets. The analysis is set out in Table 93.

Number of data sets used by users	Frequency	Percent
Applicable but not yet used	7	23.3
6-10	1	3.3
More than 20	2	6.7
Not applicable/No data available	20	66.7
Total	**30**	**100.0**

Table 93: Number of data sets (new or improved) used by users

[17] Overall, 18 projects were due to be completed after 2008.

The evaluation team also examined the impact of the FP6 projects on standards and protocols. The results of this analysis is set out in Table 94 and Table 95. It shows that 18 (60.0%) of the projects intended to generate new standards and protocols. Four (22.2% of relevant projects) had yet to generate new standards and protocols. The remaining 14 (77.8% of relevant projects) had generated between 1 and 20 new standards and protocols. Fifteen (50.0%) of projects intended to improve existing standards and protocols. Of these, 7 (46.7% of relevant projects) had yet to improve any and the other 8 (53.3% of relevant projects) had improved between 1 and 20 standards and protocols. The relatively small number of projects for whom the generation and improvement of standards and protocols was relevant meant that discerning patterns within the data when it was broken down by project instrument was not possible.

Number of new standards and protocols generated	Frequency	Percent
Applicable, but not yet completed	4	13.3
1-5	8	26.7
6-10	2	6.7
11-15	3	10.0
16-20	1	3.3
Not applicable/no data available	12	40.0
Total	**30**	**100.0**

Table 94: Number of new standards and protocols generated by FP6 projects

Number of existing standards and protocols improved	Frequency	Percent
Applicable, but not yet completed	7	23.3
1-5	7	23.3
6-10	1	3.3
Not applicable/no data available	15	50.0
Total	**30**	**100.0**

Table 95: Number of existing standards and protocols improved by FP6 projects

Project coordinators were also asked about the use of standards and protocols. The analysis is set out in Table 96.

Number of standards and protocols used by users	Frequency	Percent
Applicable, but not yet completed	4	13.3
1-5	1	3.3
11-15	2	6.7
16-20	1	3.3
Not applicable/no data available	22	73.3
Total	**30**	**100.0**

Table 96: Number of standards and protocols used by users

Project coordinators were asked to assess the scientific significance of data sets, standards or protocols generated or improved by FP6 projects. Results are set out in Table 97. The most common response for those to whom the issue was relevant (n = 14, 46.7%) was to improve conditions for new knowledge generation, an example being easier-to-use interfaces or integration with RIs.

Scientific significance of new or improved data sets/standards/protocols	Frequency	Percent
Enhanced science/research agendas	3	10.0
improved conditions for new knowledge generation, e.g. easier interfaces or integration with RIs	14	46.7
Opened up or combined disciplines	2	6.7
Not applicable	11	36.7
Total	**30**	**100.0**

Table 97: The scientific significance of data sets, standards or protocols generated or improved by FP6 projects

A broader impact that FP6 projects could potentially have had in relation to access to data was to improve access to European data repositories or archives for a range of beneficiaries. However, only 6 (20.0%) of the project coordinators reported that they had improved such access. Five of these were I3 projects. The majority (n = 17, 56.7%) of projects reported that this type of impact was not applicable.

Speed of access and network capacity

Of particular relevance to e-infrastructure projects, but potentially of relevance to all FP6 projects are issues of speed of access and network capacity.

- Coordinators from 7 projects (23.3%) reported that increasing the speed of connection was a relevant impact for their project. Of these 4 (57.1% of relevant projects) had increased connection speed. Three of these were I3 projects.
- Coordinators from 13 projects (43.3%) reported that end-user speed of access to new outputs from the FP6 project was a priority. The coordinators assessed that for 12 out of these 13 projects, speed of access had been an 'important' or 'essential' factor in achieving project success. A high proportion of these were I3 projects. Ten of the 13 projects were Integrated Infrastructure Initiative projects meaning that achieving end-user speed of access was important or essential for 58.8% of I3 projects.
- Coordinators from 10 (33.3%) projects reported that increasing capacity for data traffic18 over the network was a relevant impact for their project. Five (50% of relevant projects) reported that they had increased such capacity. All of these were I3 projects.
- Coordinators from 9 (30.0%) projects reported that increasing traffic over the network was a relevant impact for their project. Seven (77.8% of relevant projects) reported that they had achieved this. All of these were I3 projects.

Project coordinators were also asked about data licensing and specifically the extent to which access to data is subject to licensing. Fifteen (50.0%) reported that this was not applicable to their

[18] 'Traffic' is defined as electronic data exchange throughout this document unless stated otherwise.

project. Of the remaining 15, only 2 (13.3% of relevant projects) confirmed that access to data was subject to licensing.

Impacts on policy at national, European and international level

Twenty one (70.0%) of project coordinators reported that their project had influenced regional or national policies on RIs. Project coordinators were also asked about the degree of impact. Based on their responses the evaluation team assessed the level of impact achieved where a low impact was defined as awareness raising amongst policy-makers through to a high impact which was defined as a commitment to investment or coordination with other countries' RI polices on the part of policy-makers. In making this assessment, the strength of evidence gathered by the evaluation team was also taken into account. The evaluation team's assessment of the level of impact on regional and national RI policies is set out in Table 98. In 14 projects (53.3%) the level of impact was assessed as medium or low. In 6 projects (20%) it was assessed as high and in 1 project (3.3%) it was assessed as mixed. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Level of impact	Frequency	Percent
Low	5	16.6
Medium	9	30.0
High	6	20.0
Mixed	1	3.3
Not applicable	9	30.0
Total	**30**	**100.0**

Table 98: Evaluation team's assessment of level of impact on regional or national RI policies

Similar questions were asked of project coordinators in relation to the extent that the FP6 project had influenced European and/or international policies on RIs. Nineteen (63.3%) project coordinators reported that their project had influenced European and/or international policies. A relatively high proportion of these were I3 projects. Again, project coordinators were also asked about the degree of impact and responses were assessed by the evaluation team using the same impact scale. The evaluation team's assessment of the level of impact on European and/or international policies on RIs is set out in Table 99. In 13 projects (46.6%) the level of impact was assessed as medium or low. In 6 projects (20.0%) it was assessed as high. Five of these 6 projects were I3 projects.

Level of impact	Frequency	Percent
Low	6	20.0
Medium	7	23.3
High	6	20.0
Not applicable	11	36.6
Total	**30**	**100.0**

Table 99: Evaluation team's assessment of level of impact on European and/or international RI policies

Similar questions were asked of project coordinators in relation to the extent that the FP6 project had influenced policy-making in other domains. Examples of other domains that were given during the fieldwork included 'health' and 'the environment'. Twenty (66.7%) project coordinators reported that their project had not influenced policy-making in other domains, 7 (23.3%) reported that it had and 1 (3.3%) reported a mixed impact. A high proportion of these were I3 projects. Six of the 8 projects reporting an impact or a mixed impact were I3 projects.

The same process described above for assessing the level of impact was undertaken by the evaluation team. The evaluation team's assessment of the level of impact on other policy domains is set out in Table 100. Eight (26.6%) project coordinators reported an impact (in one case a mixed impact). For all 8 projects (26.6%) the level of impact was assessed as medium or low. It was not assessed as high in any projects.

Level of impact	Frequency	Percent
Low	6	20.0
Medium	2	6.7
Not applicable	22	73.3
Total	**30**	**100.0**

Table 100: Evaluation team's assessment of level of impact on other policy domains

Impacts on economy, industry and wider society

The evaluation team examined a range of potential impacts that FP6 projects might have had on the economy, industry and wider society.

- Four (13.3%) project coordinators reported that their project had achieved commercialisable economic outcomes to date. Seven (23.3%) reported that such outcomes were not applicable to their project. Nineteen (63.3%) reported that that their project had not achieved such outcomes to date.
- Twelve (40.0%) project coordinators reported that their project had directly or indirectly generated new business for suppliers and manufacturers of goods and services to the RI. Seven (23.3%) reported that such outcomes were not applicable to their project. Eleven (36.7%) project coordinators reported that their project had not achieved such outcomes to date.
- Fourteen (46.7%) project coordinators reported that their project had directly or indirectly generated new jobs. Five (16.7%) reported that such outcomes were not applicable to their project. Eleven (36.7%) project coordinators reported that their project had not achieved such outcomes to date.
- Seven (23.3%) project coordinators reported that their project had directly or indirectly generated a regional economic impact. Six (20.0%) reported that such outcomes were not applicable to their project. Seventeen (56.7%) project coordinators reported that their project had not achieved such outcomes to date.
- Nine (30.0%) project coordinators reported that their project had triggered researchers in their RI or institution to move into industry. Six (20.0%) reported that such outcomes were not applicable to their project. Fifteen (50.0%) project coordinators reported that their project had not achieved such outcomes to date.

An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects. The exception was analysis of projects that had triggered researchers in their RI or institution to move into industry. A high proportion of these were I3 projects. Seven of the 9 projects were I3 projects meaning that triggering researchers to move into industry was an outcome for 41.2% of I3 projects.

Structuring effects and added value

Creating new networks of researchers

Project coordinators were asked whether their FP6 project had enabled the creation of new, formal researcher networks. Seventeen (56.7%) reported that this was a relevant impact to their project and 13 (76.5% of relevant projects) reported creating 1 or more new formal networks. Project coordinators were also asked about the expansion of existing formal networks. Sixteen (53.3%) reported that this was a relevant impact to their project and 10 (62.5% of relevant projects) reported expanding 1 or more existing formal networks. Table 101 and Table 102 summarise this analysis. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Number of new networks	Frequency	Percent
0	4	13.3
1-2	7	23.3
3-4	1	3.3
5-10	4	13.3
More than 10	1	3.3
Not applicable	13	43.3
Total	**30**	**100.0**

Table 101: Creation of new formal networks enabled by FP6 projects

Number of extended networks	Frequency	Percent
0	6	20.0
1-2	4	13.3
3-4	2	6.7
5-10	3	10.0
More than 10	1	3.3
Not applicable	14	46.7
Total	**30**	**100.0**

Table 102: Expansion of existing formal networks enabled by FP6 projects

Project coordinators were asked whether their FP6 project had enabled the creation of new informal researcher networks. Fifteen (50.0%) reported that this was a relevant impact to their project and 10 (66.6% of relevant projects) reported creating 1 or more new informal networks. Project coordinators were also asked about the expansion of existing informal networks. Sixteen (53.3%) reported that this was a relevant impact to their project and 9 (56.2% of relevant projects) reported expanding 1 or more existing informal networks. Table 103 and Table 104 summarise this analysis. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Number of new networks	Frequency	Percent
0	5	16.7
1-2	5	16.7
5-10	1	3.3
More than 10	4	13.3
Not applicable	15	50.0
Total	**30**	**100.0**

Table 103: Creation of new informal networks enabled by FP6 projects

Number of extended networks	Frequency	Percent
Uncodable data	1	3.3
0	6	20.0
1-2	6	20.0
3-4	1	3.3
More than 10	2	6.7
Not applicable	14	46.7
Total	**30**	**100.0**

Table 104: Expansion of existing informal networks enabled by FP6 projects

In relation to the creation of new virtual communities or the expansion of existing ones, nineteen (63.3%) project coordinators reported that this was a relevant impact for their project. Thirteen (68.4% of relevant projects) reported that they had created or expanded virtual communities. A high proportion of these were I3 projects. Eleven of the 13 projects were Integrated Infrastructure Initiative projects meaning that the creation or expansion of virtual communities was an outcome for 64.7% of I3 projects.

Impacts on science communities in New Member States

Have the FP6 projects led to more involvement of researchers from New Member States in European communities or networks? Nineteen (63.3%) project coordinators responded in the affirmative to this question with only 4 (13.3%) saying that their project had not led to more involvement. For a further 7 (23.3%) this type of impact was not relevant to their FP6 project. Of the nineteen that responded in the affirmative a high proportion of these were I3 projects. Fourteen of the 19 projects were I3 projects meaning that achieving more involvement of researchers from New Member States was an impact for 82.3% of I3 projects.

Thirteen project coordinators reported that their FP6 project had improved RIs in New Member States. Seven (23.3%) reported that their project had not had this type of impact and for ten (33.3%) this type of impact was not applicable to their project. For the thirteen that had improved RIs in New Member States a high proportion of these were I3 projects. Twelve of the 13 projects were I3 projects meaning that bringing about improvements in New Member States was an impact for 70.6% of I3 projects.

Evidence was also sought on whether FP6 projects have enabled participant organisations or users from New Member States to undertake new, more or better research. Project coordinators responded on this point and the evaluation team then assessed the strength of the available evidence (see Table 105 and Table 106).

- There was some evidence to suggest that FP6 projects had enabled participant organisations from New Member States to undertake new, more or better research in 11 (36.7%) projects and exhaustive evidence in a further 3 (10.0%) projects. A high proportion of these were I3 projects. Twelve of the 14 projects were I3 projects meaning that enabling participant organisations from New Member States to undertake new, more or better research was an impact for 70.6% of I3 projects.
- There was some evidence to suggest that FP6 projects had enabled users from New Member States to undertake new, more or better research in 7 (23.3%) projects and exhaustive evidence in a further 4 (13.3%) projects. A high proportion of these were I3 projects. Ten of the 11 projects were I3 projects meaning that enabling users from New Member States to undertake new, more or better research was an impact for 58.8% of I3 projects.

Level of evidence	Frequency	Percent
Exhaustive evidence	3	10.0
Some evidence	11	36.7
No evidence to support attribution	13	43.3
Not applicable	3	10.0
Total	**30**	**100.0**

Table 105: Evaluation team's assessment of evidence of the FP6 project enabling participant organisations from New Member States to undertake new, more or better research

Level of evidence	Frequency	Percent
Exhaustive evidence	4	13.3
Some evidence	7	23.3
No evidence to support attribution	10	33.3
Not applicable	9	30.0
Total	**30**	**100.0**

Table 106: Evaluation team's assessment of evidence of the FP6 project enabling users from New Member States to undertake new, more or better research

Pertinence

Meeting original needs

Project coordinators were asked to assess how well outcomes delivered by the FP6 project have matched the original need that the project set out to address. Their answers and the strength of supporting evidence gathered by the evaluation team was assessed and an assessment of the extent to which original needs have been met was made (see Table 107). Fifteen projects (50.0%) were judged to have met fully the original need that the project set out to address and a further 7 (23.3%) to have exceeded that need. Six of these 7 were I3 projects.

Extent to which original needs have been met	Frequency	Percent
Exceeded	7	23.3
Fully met	15	50.0
No information	2	6.7
Partially met	6	20.0
Total	**30**	**100.0**

Table 107: Evaluation team's assessment of the extent to which original needs of FP6 projects have been met

User feedback

Project coordinators were asked about user feedback. Nineteen coordinators (63.3%) reported that user feedback had been sought. Six (23.3%) reported it hadn't been sought and five (13.3%) that this was not applicable to their project. Analysing projects by instrument:

- Fourteen (82.4%) I3 projects had sought feedback
- Two (66.7%) CA projects had sought feedback
- Three (30.0%) of SSA projects had sought feedback

Coordinators were also asked about the impact of feedback on project delivery. Evidence was gathered by the evaluation team and its strength assessed. For the nineteen projects that had gathered user feedback, impact on project delivery was assessed to be strong in 5 (16.7%) projects and a weak in 10 (33.3%). In the case of 4 projects, there was no impact on project delivery. A high proportion of these were I3 projects (see Table 108). Eleven of the 15 projects with a weak or strong impact were I3 projects meaning that there was evidence of user feedback impacting on project delivery in 64.7% of I3 projects.

Level of impact	Frequency	Percent
Strong impact	5	16.7
Weak impact	10	33.3
No impact	4	13.3
Not applicable	11	36.7
Total	**30**	**100.0**

Table 108: Evaluation teams' assessment of the impact of user feedback on project delivery

Periodic assessment

Twenty two (73.3%) projects had been subject to some form of internal or external assessment. The impact of periodic assessment was also investigated by the evaluation team who questioned coordinators and gathered evidence, the strength of which was assessed. This analysis is set out in Table 109 and shows that periodic assessment led to important changes in 2 (6.7%) projects and small changes in a further 9 (30.0%) projects. Both of the projects where periodic assessment led to important changes were I3 projects.

Level of impact	Frequency	Percent
Important changes	2	6.7
Small changes	9	30.0
No changes	10	33.3
Not applicable	9	30.0
Total	**30**	**100.0**

Table 109: Evaluation teams' assessment of the impact of periodic assessment on the delivery of FP6 projects

Critical factors in project delivery

To better understand the main factors that enabled or hindered the achievement of FP6 project outcomes and objectives, coordinators were asked to identify enabling and hindering factors. Coordinators gave a number of answers. These were analysed by the evaluation team and classifications of enabling and hindering factors were identified. Coordinators' responses were then coded using these classifications. Table 110 and Table 111 provide a summary of answers given in relation to enabling and hindering factors. Some project coordinators identified more than factor so the number of responses is greater than 30. The most commonly identified enabling factors were 'shared vision and commitment' (n = 16, 36.4%) followed by 'quality of staff' (n = 10, 22.7%). The most commonly identified hindering factors were 'European Commission reporting requirements' (n = 6, 18.2%) and 'time taken to hire staff' (n = 6, 18.2%) followed by 'budget' (n = 5, 15.2%). However, it is worth noting that 'budget' was also identified as an enabling factor by 5 (15.2%) projects. An analysis by project instrument showed that distribution across instruments was similar to that across all 30 case study projects.

Enabling factors	Frequency	Percent
Bring together diverse skills and experience	2	4.5
Budget	5	11.4
Clear structures for decision making	3	6.8
Quality of staff	10	22.7
Shared vision and commitment	16	36.4
Face to face meetings	4	9.1
Leadership	1	2.3
Previous experience of RIs gained either at national level or previous rounds of FP	3	6.8
Total	**44**	**100**

Table 110: Factors enabling achievement of FP6 project objectives and outcomes

Hindering factors	Frequency	Percent
Barriers to adoption by industry	2	6.1
Budget	5	15.2
Cultural differences between partners	3	9.1
Differing visions	3	9.1
Difficulty in reaching potential users	2	6.1
Distance	1	3.0
EC reporting requirements	6	18.2
Lack of project management skills	3	9.1
Loss of key staff	2	6.1
Time taken to hire staff	6	18.2
Total	**33**	**100**

Table 111: Factors hindering achievement of FP6 project objectives and outcomes

Project coordinators were also asked whether their experience on this FP6 project differed from other FP or transnational projects. Fifteen (50.0%) said that it did and seven (23.3%) said that it did not. The question was judged not to be applicable by 8 (26.7%) coordinators. A high proportion of those who said it did make a difference were I3 projects. Eleven of the 15 projects were I3 projects meaning that 64.7% of I3 projects felt their experience differed.

Funding, leverage and sustainability

The evaluation team's investigation of funding focused in particular on leverage and sustainability.

Table 112, Table 113 and Table 114 show project coordinators reports of their overall projects' budgets, EC funding provided to the project and EC funding as a percentage of total project budget.

- Over half of projects (n = 16, 53.4%) had budgets of less than 10 million Euros and only 3 (10.0%) had budgets of more than 30 million Euros.
- Half of projects (n = 15, 50.0%) received EC funding of less than 5 million Euros and only 4 projects (13.3%) received EC funding of 20 million Euros or more.
- For over half of projects (n = 16, 53.3%) EC funding accounted for between 76 and 100% of their project funding.

Budget	Frequency	Percent
Less than 5m	11	36.7
Less than 10m	5	16.7
Less than 20m	6	20.0
Less than 30m	5	16.7
30m or more	3	10.0
Total	**30**	**100.0**

Table 112: Total project budget

EC funding	Frequency	Percent
20m or more	4	13.3
Less than 10m	7	23.3
Less than 15m	4	13.3
Less than 5m	15	50.0
Total	**30**	**100.0**

Table 113: Total EC funding

EC funding as a % of total project budget	Frequency	Percent
0-25%	3	10.0
26-50%	3	10.0
51-75%	8	26.7
76-100%	16	53.3
Total	**30**	**100.0**

Table 114: EC funding as a percentage of total project budget

Coordinators were asked what the contribution to the FP6 project was by their organisation in addition to EC funding. Their responses are set out in Table 115 and show a range of contributions from zero to sums in excess of 20 million Euros (the highest specific figure provided was 27 million Euros). Coordinators were also asked whether their organisation's funding was contingent on receiving EC funding. Eight (26.7%) said that it was, seven (23.3%) said that it was not and 15 (50.0%) said that this issue was not applicable. The participant organisations might have also contributed financially to the project but it was not possible to collect this data from all the relevant organisations.

Euros	**Frequency**	**Percent**
More than 20m	3	10.0
5m – 20m	1	3.3
Less than 5m	11	36.7
0	9	30.0
Not applicable	6	20.0
Total	**30**	**100.0**

Table 115: Contribution to the FP6 project by coordinator's organisation in addition to EC funding

The evaluation team also sought information on how many additional resources (funding and effort) was spent by formal and informal project participants beyond the original project budget. Primarily, this data was provided by project coordinators who estimated this additional resource. Table 116 shows that additional resources ranged from zero to more than 100 percent of the original budget. Analysis by project instrument suggests that I3 projects are over-represented amongst projects which levered in fewer additional resources (I3 projects make up 69.2% of projects with between 0 - 50% of levered in funding) and under-represented in projects which levered in more additional resources (I3 projects make up 40.0% of projects with more than 50% of resources levered in).

Additional resources as % of project budget	Frequency	Percent
Uncodable data	2	6.7
0%	3	10.0
1-25%	6	20.0
26-50%	4	13.3
76-100%	3	10.0
More than 100%	2	6.7
No data	10	33.3
Total	**30**	**100.0**

Table 116: Additional resources spent by formal and informal project participants as a percentage of the original budget

Follow-on funding

A number of aspects of follow-on funding were explored.

- Fourteen (46.7%) project coordinators reported that they had secured follow-on funding, while 11 (36.7%) reported that they had not. This issue was not applicable to 5 (16.7%) projects.
- Twenty five (83.3%) project coordinators said the realisation of FP6 project impacts was contingent to some degree or a strong degree on other funding or follow-on funding from the EC. Only five (16.6%) said it was either not applicable or not contingent at all.
- Fifteen (50.0%) project coordinators reported that their organisation had applied specifically for FP6 infrastructures funding rather than other funding because there were no other viable sources of funding. A further 8 (26.7%) reported that there were other viable sources, but that EC funding was preferred. Seven (23.3%) reported that this issue was not applicable to their project. Of the 15 project coordinators who reported that their organisation had applied specifically for FP6 infrastructures funding rather than other funding 11 were I3 projects (64.7% of I3 projects in the case study sample).
- Twenty two (73.3%) project coordinators reported partial or full European and national funding is available for maintenance and upgrading of their RI.
- Twelve (40.0%) project coordinators reported that ‘international networking/exchange of staff/dissemination of results’ that was funded through FP6 would not have been funded otherwise. Ten (33.3%) project coordinators reported that ‘international access to facilities by staff or users’ that was funded through FP6 would not have been funded otherwise. All ten of these projects were I3 projects. Eight (26.7) project coordinators reported other activities that would not have been funded otherwise.
- Eight (26.7%) project coordinators reported that the FP6 project would continue as before in its same format with or without EC funding. Five out of these 8 were SSA projects (50.0% of all SSA projects in the case study sample). A further 18 (60.0%) reported that the project would continue partially. Only 3 (10.0%) reported that the project would not continue and 1 that this issue was not applicable to their project.

Project coordinators were also asked what types of projects they would seek European RI funding for in the future, which couldn’t be funded through other sources. The results are shown in Table 117. A range of project types are mentioned, the most common being research and networking (n = 10, 33.3%), upgrading (n = 7, 23.3%) and training and access (n = 6, 20.0%).

Type of project	Frequency	Percent
Grid development	2	6.7
No information	2	6.7
Other	3	10.0
Research and networking	10	33.3
Training and access	6	20.0
Upgrading	7	23.3
Total	**30**	**100.0**

Table 117: Types of projects project coordinators would seek European RI funding for in the future, which couldn't be funded through other sources

Appendix E – Findings from the economic assessment

This section describes findings from the economic analysis of the FP6 projects. It is structured under four main areas:

- Descriptive analysis of funding received by projects
- Bi-variate analysis of the association between EC funding received by project and its effect
- Multivariate regression analysis of association between EC funding by project and its effect while controlling for other predictors of impact (other than EC funding)
- Summary of key findings from the economic assessment

As indicated in the methods section for the economic assessment (see p. 31), it is important to note the rationale for the economic analysis at instrument level. The purpose here was to measure the differential effect of funding directed to I3 projects as opposed to other types of projects (CA/SSA). The I3 projects were considered unique in the sense that they are a new instrument implemented for the first time under the FP6 and the activities of these projects are solely based on enhancing the functioning of existing research infrastructures. The analysis reported by instrument type therefore compares I3 projects to other types of projects in terms of the differential effect of funding in the context of impacts.

Descriptive analysis

This section provides descriptive summary of the funding received by FP6 projects. The analysis was undertaken for three subgroups of projects: instrument type, infrastructure type and scheme type.

The breakdown of projects by **instrument type** is as follows: 37 SSA/CA projects (46% of sample) and 53 I3 projects (64% of sample). Table 118 reports the results of the analysis of the funding repeated by these sub-groups.

- EC funding for I3 projects was on average €12 million, considerably higher than for SSA/CA projects which average EC funding was on average €4.3 million.
- The average total budget for SSA/CA projects was double that for I3 projects.
- I3 projects received a higher proportion of their funding from the EC than SS/CA projects (72% vs. 57%). For all I3 projects, at least 33% of the total budget came from the EC.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
SSA/CA					
EC funding	37	€4,297,980	€3,581,204	€475,400	€11,000,000
Total project budget	37	€36,984,369	€99,442,877	€629,400	€564,787,000
% budget from EC	37	57.1%	31.8%	1.5%	100.0%
I3					
EC funding	43	€11,963,957	€14,953,921	€1,000,000	€93,000,000
Total project budget	43	€18,126,023	€27,492,521	€1,270,000	€178,590,000
% budget from EC	43	71.9%	17.1%	32.8%	99. 7%

Table 118: Descriptive analysis of funding received by FP6 projects by instrument type

The analysis funding by infrastructure type was based on data for 13 DG INFSO funded projects (16.3% of sample) and 67 DG RTD funded projects (83.5%). Table 119 describes the reports the funding received by these sub-groups.

- The average EC funding for DG INFSO projects was more than double that for DG RTD projects.
- The total budget received by the two groups of projects was similar, at around €26.4 million.
- The percentage of total budget funded by EC was 71.2% for DG INFSO projects and 63.8% for DG RTD projects.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
DG INFSO funding					
EC funding	13	€15,283,169	€26,272,916	€1,000,000	€93,000,000
Total project budget	13	€25,822,146	€49,124,510	€1,210,000	€178,590,000
% budget from EC	13	71.2%	20.8%	32.8%	99.7%
DG RTD funding					
EC funding	67	€7,086,481	€5,515,523	€475,400	€27,000,000
Total project budget	67	€27,047,056	€74,451,825	€629,400	€564,787,000
% budget from EC	67	63.8%	26.7%	1.5%	100.0%

Table 119: Descriptive analysis of funding received by FP6 projects by infrastructure type

The whole sample of projects was classified into four scheme types: Communication and Network Development (16.3%), Construction of New Infrastructure (7.5%), Design Study (23.8%), and Integrating Activity (52.5%). Table 120 describes the funding received by these four groups of projects.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Communication and Network Development					
EC funding	13	€15,283,169	€26,272,916	€1,000,000	€93,000,000
Total project budget	13	€25,822,146	€49,124,510	€1,210,000	€178,590,000
% budget from EC	13	71.2%	20.8%	32.8%	99.7%
Construction of New Infrastructure					
EC funding	6	€7,482,640	€4,354,179	€1,912,120	€11,000,000
Total project budget	6	€183,627,586	€199,101,306	€20,593,498	€564,787,000
% budget from EC	6	6.5%	2.8%	1.5%	10.0%
Design Study					
EC funding	19	€4,855,011	€3,506,763	€475,400	€10,439,962
Total project budget	19	€12,628,015	€12,879,485	€629,400	€41,686,157
% budget from EC	19	54.2%	21.4%	20.1%	100.0%
Integrating Activity					
EC funding	42	€8,039,362	€6,164,319	€720,000	€27,000,000
Total project budget	42	€11,201,308	€8,624,505	€720,000	€35,141,200
% budget from EC	42	76.3%	16.2%	36.9%	100.0%

Table 120: Descriptive analysis of funding received by FP6 projects by scheme type

The average EC funding was greatest for Communication and Network Development projects (€15.3 million). This was about twice as much as the EC funding received by Construction of New Infrastructure projects (€7.5 millions) and Integrating Activity projects (€8 million), and three times that received by Design Study project (€4.9 million).

Despite Construction of New Infrastructure projects on receiving more EC funding on average than other project, the larger size of these projects meant that EC funding only made up a small proportion of their total funding (6.5%). This compares with the much larger proportion of funding received from the EC for other types of projects: Design Study projects (54.2%), Communication and Network Development (71.2%), and Integrating Activity (76.3%).

Bivariate analysis

This section summarises the result of the bivariate analysis undertaken to assess whether there was an association between the amount of EC funding received by a project and its effect. The analysis is reported separately for the whole sample of projects and then just for I3 projects.

All projects

The results of the bivariate analysis for all projects are shown in Table 121. A statistically significant correlation between the amount of EC funding received by projects and their effects was identified for one effect measure: liaison with local communities. Specifically, the greater the funding received by FP6 projects, the greater their effectiveness on liaising with local communities.

The associations between the amount of EC funding received by FP6 projects and the other effect measures included in the analysis (i.e. improvements in New Member States; networking for researchers; priority in national research policies; and, industry participation) were found not statistically significant.

Impact measure	Whole sample
Liaison with local communities	0.224*
Improvements in New Member States	0.084
Networking of researchers	-0.015
Priority in National research policies	-0.043
Industry participation	-0.007

*Statistically significant relationship at 10% confidence level

Table 121: Correlation coefficients between EC funding and impact

The results of the bivariate analysis by instrument type are shown in Table 122. These demonstrate that there is a statistically significant relationship between the amount of EC funding received and industry participation for SSA/CA projects. That is, those SSA/CA projects that received more EC funding also demonstrated greater industry participation. Those SSA/CA projects that had a positive impact on industry participation received on average €7.3 million in EC funding, while those projects that did not have a positive impact on industry participation on average received €3.6 million in EC funding (a t-test reveals a statistically significant difference in the funding received by these two groups ($t = -2.64$, $p=0.012$)).

The associations between the amount of EC funding received by SSA/CA projects and the other impact measures (i.e. liaison with local communities; improvements in New Member States; networking for researchers; and priority in national research policies) were found non-significant. Further, the amount of EC funding received by I3 projects had no statistically significant association with the impact measures under analysis.

Impact measure	By instrument type	
	SSA/CA	I3
Liaison with local communities	0.110	0.224
Improvements in New Member States	-0.179	0.123
Networking of researchers	-0.226	-0.048
Priority in National research policies	0.120	-0.054
Industry participation	0.408 **	-0.092

*Statistically significant relationship at 5% confidence level

Table 122: Correlation coefficients between EC funding and impact by instrument type

The results of the bivariate analysis by infrastructure type are shown in Table 123. The relationship between EC funding and the impact variables was found non-significant for all infrastructure types. Moreover, these results suggest that infrastructure type was not a determining factor on whether EC funding had a significant effect on the impacts of the projects.

Impact measure	By infrastructure type	
	DG INFSO funding	DG RTD funding
Liaison with local communities	0.381	0.124
Improvements in New Member States	0.191	-0.020
Networking of researchers	-0.190	0.069
Priority in National research policies	-0.326	0.006
Industry participation	-0.113	0.014

Table 123: Correlation coefficients between EC funding and impact by infrastructure type

The results of the bivariate analysis by scheme type are shown in Table 124. These demonstrate that the associations between the amount of EC funding received by projects of different scheme types and the effect of the projects were non-statistically significant. These results also suggest that the scheme type was not a determining factor on whether EC funding had a significant effect on the impacts of the projects.

Impact measure	By scheme type			
	Communication and Network Development	Construction of New Infrastructure	Design Study	Integrating activity
Liaison with local communities	0.381	-0.066	0.109	0.150
Improvements in New Member States	0.191	-0.548	-0.186	0.060
Networking of researchers	-0.190	-0.135	0.082	0.078
Priority in National research policies	-0.326	0.626	-0.137	0.133
Industry participation	-0.113	0.573	0.185	-0.043

Table 124: Correlation coefficients between EC funding and impact by scheme type

I3 projects

The results of the analysis for all I3 projects on four different effect measures are shown in Table 125. These demonstrate that the associations between the amount of EC funding received by I3 projects and the impact measures of the projects were found non-statistically significant.

Impact measure	All I3 projects
Number of young researchers	0.139
Quality of research infrastructure services	0.045
Equipment training	0.154
Integrated datasets	0.029

Table 125: Correlation coefficients between EC funding and impact variables for I3 projects

The results of the bivariate analysis for just I3 projects distinguishing between projects of different infrastructure type and scheme type are shown in Table 126. Specifically, this analysis distinguishes: (a) Communication and Network Development projects (all funded by DG INFSO), from (b) Integrating Activity projects (all funded by DG RTD).

Once again, the associations between the amount of EC funding received and the impact measures were generally found non-statistically significant. The only exception was the association between the level of EC funding received by DG RTD funded projects and the effect of the projects on equipment training. Specifically, those DG RTD projects that had a positive impact on equipment training received on average €10.9 million in EC funding, while those that failed to have a positive impact on equipment training received only €6.7 million (a t-test reveals a statistically significant difference in the funding received by these two groups (t = -1.71, p=0.097).

Impact measure	By infrastructure and scheme type	
	DG INFSO funding / Communication and Network Development	DG RTD funding / Integrating Activity
Number of young researchers	0.129	0.248
Quality of research infrastructure services	#	0.043
Equipment training	0.129	0.298 *
Integrated datasets	0.151	-0.165

No variation in impact between projects.
*Statistically significant relationship at 10% confidence level

Table 126: Correlation coefficients between EC funding and effect for I3 projects by infrastructure and scheme type

Multivariate regression analysis

The second approach employed to evaluate the effect of EC funding on the impacts of FP6 projects was a multivariate regression analysis. The rationale for undertaking a regression analysis is that even though the impact of FP6 project may be associated with the level of EC funding, other factors may also have an effect on the impact of FP6 projects. If these effects are not controlled for, omitting them from the analysis may lead to mistaken conclusions. Therefore, the regression analysis evaluated the effect of EC funding while controlling for other predictors of impact (as listed in the economic analysis methodology section in p. 49).

Statistic significance of the coefficients is given by the Wald statistics, and their associated probability. A predictor was judged statistically significant if the associated probability of the Wald statistic was less than 0.10 (10%). In that case the coefficient for the predictor is significantly different from zero, and therefore it can be assumed that the predictor is making a significant contribution to the prediction of the impact variable.

All instrument types

The regression analysis showed that, after controlling for the impact of other factors, few of the effects measured were significantly associated with the amount of EC funding received or the type of FP6 project receiving the funding.

The exception to this rule was the effect of FP6 projects on industry participation. The coefficient on the EC funding variable in model (a) is positive but non-significant. However, by including the interaction between EC funding and instrument type in model (b), a differential effect of EC funding by instrument type was found. The coefficient of the interactive term between EC funding and instrument type is negative and significantly different from zero. This result indicates that EC funding received by SSA/CA projects produced a significantly greater effect on the level of industry participation than that received by I3 projects. That is, if the objective is to improve industry participation, EC funding would be better directed towards SSA/CA projects.

There was no statistically significant association between whether EC funding was directed at either SSA/CA projects or I3 projects and any of the following effects: liaison with local communities, improvement in New Member States, networking of researchers, and priority in National research policies.

There was no statistically significant association between whether EC funding was directed at either RTD projects or INFSO projects and any of the following effects: industry participation, liaison with local communities, improvement in New Member States, networking of researchers, and priority in National research policies.

I3 projects

The regression analysis showed that few of the effects measured were significantly associated with the amount of EC funding received or whether EC funding was directed to projects funded by DG INFSO or those funded by DG RTD.

The exception was the effect of funding on the number of young researchers. The results showed that the coefficient on EC funding in model (a) is negative and non-significant. However, the coefficient of the interaction term between EC funding and infrastructure type in model (c) is positive and significantly different from zero. This indicates that the effect of EC funding is different depending on the infrastructure type. That is, EC funding directed to RTD projects produced a greater effect on the number of young researchers than EC funding directed towards INFSO projects.

Summary

The objective of the analysis reported in this appendix was to explore the distribution of EC funding across FP6 projects and assess the relative efficiency of different types of FP6 project.

On average, the level of EC funding received by projects was nearly €8.5 million, but varied from less than €0.5 million to more than €90 million. To some extent this variation was associated with the type of FP project:

- In both absolute and relative terms I3 projects tended to receive more EC funding (on average €12 million, or 72% of total funding) than SSA/CA projects (€4.3 million, or 57% of total funding).
- The average EC funding for DG INFSO projects was more than double than that for DG RTD projects.
- The average EC funding was greatest for Communication and Network Development projects (€15.3 million). This was about twice as much as the EC funding received by Construction of New Infrastructure projects (€7.5 millions) and Integrating Activity projects (€8 million), and three times that received by Design Study projects (€4.9 million).

However, the larger size of Construction of New Infrastructure projects meant that EC funding made up a smaller proportion of total funding (6.5% compares with 54.2% for Deign Study projects, 71.2% for Communication and Network Development, and 76.3% Integrating Activity).

The variation in EC funding levels was rarely associated with the effectiveness of the FP6 projects. In particular, the association between the level of EC funding or whether the funding was received by different types of projects and the following measures of effectiveness were found non-statistically significant:

- Liaison with local communities.
- Improvements in New Member States.
- Networking of researchers.
- Priority in National research policies.
- Quality of research infrastructure services.
- Equipment training.
- Integrated datasets.

However, the analysis did produce a number of findings about the relative efficiency of FP6 projects, including:

- EC funding directed to SSA/CA projects produced a greater effect on industry participation than funding directed to I3 projects.
- EC funding of I3 projects directed to RTD projects produced a greater effect on the number of young researchers working in the area than funding directed to INFSO projects.

These findings could be employed to inform the future distribution of EC funding. To the extent to which EC decision-makers are interested increasing industry participation, they should fund SSA/CA projects rather than I3 projects. To the extent to which EC decision makers are interested in funding I3 projects to increase the number of young researchers working in an area, they should fund RTD projects rather than INFSO projects.

However, these conclusions are subject to a number of important caveats. First, the sample sizes available to the analysis were small. This is one possible reason why so few statistically significant associations were identified in the analysis. Second, the impact measures used were self-reported assessments of recipients of EC funding, and are thus subject to the biases associated with such data collection methods. Third, the impact measures employed were categorical in nature, and were collapsed into binary variables to facilitate the analysis. This calls into question the sensitivity of the measures to changes in the performance of projects, as well as limiting the variation in the impact measures used. Both these caveats would reduce the likelihood that the analysis would identify effects. Fourth, as noted in the introduction, the research design is limited in its ability to measure the counterfactual – what would have happened in the absence of FP6 funding? Finally, the economic analysis is restricted to an assessment of the relative efficiency of FP6 projects, and is not able to assess whether the FP6 has been a good use of public resources.

Appendix F – Findings from Impact assessment

This section describes the findings from the impact assessment. It excludes results that were not found to be statistically significant.

The section is structured according to the main impact areas investigated in this evaluation:

- Impact on Research Infrastructures
- Impact on science communities
- Impact on research policy
- Impact on economy, industry and wider society
- Structuring effect and the European Added Value

> Technical note:
>
> To facilitate the interpretation of the impact analysis tables, please note the following:
>
> - Individual analysis refers to bi-variate analysis
> - Controlled analysis refers to multivariate analysis (controls for other predictors)
> - The direction of the arrow indicates the direction of relationship (positive or negative)
> - The tick indicates whether the result relates to structuring of the ERA or to European Added Value

Impacts on Research Infrastructures

Impacts in this area covered the following factors:

- Expansion of services
- Increase in the quality of RI services
- Increase in the quality of RI data
- Increase in the remote use of RI
- Increase in the number of young researchers

The sections below present the findings related to these impact measures.

Increase in the quality of RI services and organisations having expanded services

The logistic regression tested predictors for an increase in the quality of RI services. The findings from the logistic regression showed that I3 projects and the presence of New Member State partners both predicted an increase in the quality of RI services. This is shown in Table 127 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increase in the quality of RI services	I3 project vs. CA or SSA project	?	?	ü	
	NMS partners	?	-		ü

Table 127: Increase in the quality of RI services as a result of the FP6 project

The findings from analysis indicated that I3 projects were approximately eleven times more likely to have increased the quality of the RI services than CA or SSA projects (Exp β = 11.10, Wald = 9.01, p=0.0030). Similarly, if New Member States were included in the project then the project was approximately four and a half times more likely to have increased the quality of RI services (Exp β = 4.39, Wald = 4.57, p=0.033). This effect is also likely to contribute to the structuring of the ERA as a whole. However, when the influence of other predictors was controlled for, only the influence of I3 projects is statistically significant. I3 projects were approximately 18 times more likely to produce an increase in the quality of RI services than CA or SSA projects (Exp β = 17.99, Wald = 5.40, p=0.020). Nevertheless, the confidence intervals for this finding were particularly large, meaning that the project being an I3 can increase the quality of RI services anything between twice as much and 206 times as much compared to other types of projects.

In addition, the logistic regression also tested predictors for expansion of services that can be seen to contribute to the standing of European RIs and research. The findings are shown in Table 128 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Organisations having expanded services	I3 project vs. SSA or CA project	?	-	ü	
	EC funding as % of total funding	?	-	ü	

Table 128: Expanded services as a result of the FP6 project

The findings from regression analysis revealed that I3 projects were approximately three and a half times more likely to have a service expansion that CA or SSA projects (Exp β = 3.72, Wald = 6.57, p=0.010). In addition, the percentage of the budget that is EC funded was an important predictor for whether projects had expanded their services. For each additional percentage of the budget that was funded by the EC, the odds of the services having been expanded increased by a fifth, i.e. two per cent (Exp β = 1.02, Wald = 4.27, p=0.039). Overall, these effects have been generated as a result of the added value of the European support actions. However, when the influence of other predictors were controlled for, these results are not statistically significant.

Attraction and retention of researchers

The attraction and retention of researchers is an important issue for the European Commission and for national policy-makers.

To the effect of attraction and retention of scientists, the logistic regression model tested for predictors for an increase in the number of young researchers working in the FP6 project area in the partner institutions. The results are shown in Table 129:below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
No. of young researchers	NMS partners	?	-		ü

Table 129: Number of young researchers working in the science area of the FP6 project in the partner institutions

The findings from regression indicated that if New Member States were included in the project then the project was approximately three times more likely to produce an increase in the number of young researchers working in the project's research area (Exp β = 2.58, Wald = 3.88, p=0.049). The findings show that this impact has also resulted in structuring of the ERA. Furthermore, these findings could also be related to EAV to the effect that some of the young researchers working in partner institutions were funded via the FP6 project. However, when the influence of other predictors is controlled for this result is not statistically significant.

Quality of data and remote use of the Research Infrastructure

In the area of data sets, the logistic regression found evidence for increase in the quality of research data, which showed that project being I3 and New Member State involvement in projects are particularly important predictors for achieving this. The results are shown in Table 130 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increase in the quality of research data	I3 project vs. CA or SSA project	-	?	ü	
	NMS partners	-	?		ü

Table 130: Increase in quality of research data as a result of the FP6 project

The analysis showed that when the influence of other predictors was controlled for, I3 projects were approximately five times more likely to improve the quality of the research data than CA or SSA projects (Exp β = 4.94, Wald = 4.14, p=0.042). Similarly, if New Member States were included in the project then the project was approximately five and a half times more likely to improve the quality of the research data (Exp β = 5.31, Wald = 4.27, p=0.039). The findings also show that this impact was generated as a result of the added value of the EU support actions, and has resulted in structuring the ERA.

Furthermore, the logistic regression tested for predictors for an increase in the remote use of the RI. The results are shown in table 131 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring ERA
Increase in the remote use of RI	EC funding as % of total funding	?	-	ü	

Table 131: Increase in the remote use of the RI as a result of the FP6 project

The results showed that each additional percentage of the budget that was funded by the EC increased the odds of remote use of the RI by 2.7% (Exp β = 1.027, Wald = 4.69, p=0.030). However, once the influence for other predictors were controlled for, these results are not statistically significant.

Impacts on science communities

Impacts in this area covered the following factors:

- Increase in the number of non-European users
- Increase in the number of people receiving training of equipment
- Increased access due to IT quality
- Increase in the degree to which researchers are networked is presented under structuring effect!

The sections below present the findings related to these impact measures.

Increase in the number of non-European users and increased access due to IT quality

The findings from the logistic regression provided evidence that ICT e-infrastructure projects are particularly strongly associated with an increase in the number of non-European users as a result of the FP6 project, as shown is Table 132 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
No. of non-European users	ICT e-infrastructure project vs. other type of project	**?**	**?**		

Table 132: Increase in the number of non-European users as a result of the FP6 project

The analysis showed that for any project that was not an ICT-infrastructure, the odds of an increase in non-European users was a sixth of those of e-infrastructure projects. This means that e-infrastructure projects were six times more likely than any other types of projects to have increased the number of non-European users (Exp β = 0.16, Wald = 6.03, p=0.014). This also hold true when the influence from all other predictors is controlled for. When the project was not an ICT e-infrastructure, the odds of an increase in non-European users were a fiftieth of those of e-infrastructure projects. This means that e-infrastructure projects were 50 times more likely to increase the number of non-European users (Exp β = 0.019, Wald = 7.49, p=0.0062). However, it is worth noting that the confidence intervals were widely spread indicating that e-infrastructure projects are between 3 and 800 times more likely to increase the number of non-European users.

In relation to access, the logistic regression model measured increase in access to the RI as a factor of the quality of IT. The evidence showed that the project being I3 is an important predictor of this, hence supporting the findings from the descriptive analysis. The results are shown in Table 133 below. This may be an important issue to take into account therefore in the assessment of proposals for future funding.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increased access due to IT quality	I3 project vs. CA or SSA project	?	-	ü	

Table 133: Increased access to the RI due to the quality of IT

The findings indicated that I3 projects were approximately three times more likely to increase access to the RI due to IT quality than CA or SSA projects(Exp β = 3.13, Wald = 4.05, p=0.044). However, when the influence for other predictors is controlled for, this result is not statistically significant.

Training in the use of equipment

Logistic regression showed that I3 projects predicted an increase in the number of individuals receiving training in the use of equipment. In addition, the percentage of the project budget that was EC funded also predicted an increase in the number of individuals receiving training. This is shown in Table 134 below.

Model parameters		**Strength and direction of prediction [Sig. (p<0.05)]**		**Attribution of impact**	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Equipment training	I3 project vs. CA or SSA project	?	?	ü	
	EC funding as % of total funding	?	?	ü	

Table 134: Increase in the number of individuals receiving training in the use of equipment as a result of the FP6 project

The results from analysis revealed that I3 projects were approximately five times more likely to produce an increase in the number of people receiving training than CA or SSA projects (Exp β = 4.96, Wald = 10.23, p=0.0010). Similarly, for each additional percentage of the budget that is funded by the EC the odds of the project producing an increase in those receiving training was increased by a fortieth, i.e. 2.3% (Exp β = 1.023, Wald = 5.56, p=0.018). These findings also hold true when the influence of other predictors was controlled for.[19] Overall, these effects were enabled by the added value of European support actions in the field.

In addition, the regression analysis found evidence of increase in the degree to which researchers are networked. These findings however are presented under "structuring effect" on page 125.

Impacts on research policy

In relation to policy impact, the logistic regression measured a positive change in the priority given to the RI in national research policies. The individual analyses indicated that the progress towards completing the project, and whether the project was an ICT e-infrastructure or not, predicted a positive change in the priority given to the RI in national research policies. These findings are described in Table 135 below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increase in priority given to national research policies	Progress towards project completion	?	-		
	ICT e-infrastructure project vs. not	?	?		

Table 135: Priority given to the RI as a result of the FP6 project

The findings revealed that for every percentage closer towards completion the project was, the odds of more priority given to national research policies increased eightfold (Exp β = 8.66, Wald = 4.65, p=0.031). This shows a clear indication that once projects mature they are more likely to influence national research policies. In addition, for any project that was not an ICT e-infrastructure the odds of an increased priority were a fifth of those of e-infrastructure projects. This means that e-infrastructure projects were five times more likely to influence priorities in national research policies (Exp β = 0.21, Wald = 5.94, p=0.015). This is likely to indicate that the virtual character of ICT projects enforces faster change in priority given to national RI policies. Furthermore, when the influence of other predictors were controlled for, the effect of e-infrastructure projects to national RI policies remained statistically significant. If the project was not an ICT e-infrastructure project, the odds of an increased priority for other projects were a seventh of those of ICT projects. This means that e-infrastructure projects were 7 times more likely to have an impact on national RI policies (Exp β = 0.15, Wald = 4.15, p=0.042).

[19] If the project instrument was I3 the project was approximately four and a half times more likely to produce an increase in number of people receiving training (Exp β = 4.96, Wald = 4.81, p=0.028). Similarly, for each additional percentage of the budget that is funded by the EC the odds of the project producing an increase in those receiving training were increased one and a quarter times over (Exp β = 1.027, Wald = 4.70, p=0.030).

Impacts on economy, industry and wider society

This section describes the types of impact projects have had on economy, industry and wider society.

Impacts on economy and industry

To assess the factors related to impact on industry, logistic regression tested change in the industry use of the RI. The analyses indicated that the number of participants involved in the project was a statistically significant predictor of a change in industry use of the RI. The results are shown in Table 136:below:

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increase in the industry use of RI	No. of participants	?	?		

Table 136: Change in the industry use of the RI

The findings indicated that for each additional project participant the odds of the increased industry use decreased by nine tenths, i.e. 9 per cent (Exp β = 0.91, Wald = 5.72, p=0.017). This also hold true when the influence of other predictors were controlled for. Each additional participant decreased the odds of increased industry use of the RI by four fifths, i.e.17 per cent (Exp β = 0.83, Wald = 6.45, p=0.011). This indicates that the more participants projects have the less likely the RI is to be used by industry. This may be because projects with fewer participants are more focussed and often have industry priorities. This is perhaps not unexpected. The EC RI programme funding generally promotes collaboration, compared to perhaps national funding which tends to promote more competition.

Furthermore, the logistic regression also measured the generation of joint projects with industry. The findings showed that the presence of non-EU partners acted as a positive predictor for joint projects with industry. The results are shown in Table 137 below:

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Joint projects with industry	Non-EU partners	?	-		
	EC funding as % of total funding	?	-		

Table 137: Joint projects with industry

The findings revealed that the presence of non-EU partners tripled the odds of joint projects with industry (Exp β = 2.83, Wald = 3.91, p=0.048). It is not known why this is the case and potentially something to explore in the case study validation workshop. Conversely, the percentage of the total budget that is EC funded slightly decreased the odds of having joint projects with industry. For each additional percentage of the budget that was funded by the EC the odds of there being joint projects with industry decreased by approximately nineteen twentieths, i.e. by three per cent (Exp β = 0.97, Wald = 9.44, p=0.002). Again, it is not known why this is the case but again, an increase in the EC funding could alter the nature of collaboration to a more collaborative rather than competitive nature. However, when the influence of other predictors is controlled for, these results are not statistically significant for either of the predictors.

The influence of FP6 project on the creation of spin-off companies was also tested. Logistic regression found that I3 projects predicted the creation of spin-off companies. The results are shown in Table 138 below:

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Generates spin-off companies	I3 project vs. CA or SSA project	-	?	ü	

Table 138: Generation of spin-off companies as a result of the FP6 project

The findings showed that once the influence of other predictors was controlled for, I3 projects were approximately sixteen times more likely to generate spin-off companies than SSA or CA projects(Exp β =16.08, Wald = 4.74, p=0.029). The findings also indicated that this effect was generated as a result of added value of the European action (i.e. it would hot have happened without EC funding). The confidence intervals were wide which indicated that I3 projects can increase the likelihood of generating spin-off companies up to 196 times, but equally this likelihood could only be a third.

In addition, the impact of FP6 projects on the generation of IPR/patents was measured. The logistic regression found that once the influence of other predictors was controlled for, the total EC funding predicted whether the project generated IPRs or patents. The results are shown in Table 139: below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Generates IPRs/patents	Total EC funding	-	?	ü	

Table 139: Creation of IPR and patents

The results showed that for each additional Euro there was a five millionth increase in the odds of generating IPRs or patents (Exp β =1.00000023, Wald = 4.36, p=0.037). Although a very small impact, this effect was generated as a result of the added value of the European support actions.

Impact on wider society

To the effect of emerging wider societal impacts, the logistic regression model tested the extent to which the RI project increased liaison with local communities. The analyses revealed that progress towards completion predicted whether the project encouraged liaisons with local communities. The results are shown in Table 140: below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Liaison with local communities	Progress towards project completion	?	-		

Table 140: Liaison with local communities

The findings showed that every percentage closer the project is to completion, the odds that the project encouraged liaison with local communities was eleven times greater (Exp β = 11.45, Wald = 5.78, p=0.016). This means that the closer the project is to completion the more likely it is to liaise with local communities. However, when the influence of other predictors was controlled for, this result is not statistically significant. Hence this could have as much to do with obligations to fulfil a dissemination strategy as it could have to do with a real desire to have a societal impact.

Structuring effects and European Added Value

This section looks at the evidence collected to try and assess the extent to which the European Support actions to RIs have contributed to structuring the ERA. It also looks at the European Added Value of these actions.

Creating new networks of researchers

To test the effect of creating or expanding networks, the logistic regression measured a positive change in the degree to which researchers are networked. The findings highlighted that progress towards project completion, and the percentage of the budget that is EC funded, both predicted the degree to which researchers are networked. These results are shown in Table 141: below:

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
Increase in the degree to which researchers networked	Progress towards project completion	?	?		
	EC funding as % of total funding	?	?	ü	

Table 141: researchers networked in the area of science where the FP6 project operates

The findings indicated that each additional percentage of the budget that was funded by the EC increased the odds of the project producing an increase in the number of researchers that were networked by a twenty-seventh', i.e. by 3.7 per cent (Exp β = 1.037, Wald = 7.067, p=0.0080). When the influence of other predictors was controlled for, each additional percentage of the budget that was funded by the EC, increased the odds of researchers being networked by a twentieth, i.e. by five per cent (Exp β = 1.045, Wald = 3.98, p=0.046). This effect occurred as a result of the added value of European support actions. Furthermore, interestingly, for every percentage closer the project was to completion, the odds that researchers in the research area were networked was twenty times smaller (Exp β = 0.055, Wald = 4.62, p=0.032). This could be taken to indicate that the existence of the project truly fosters the fact that researchers are networked, whereas towards the end of the project this intensity has been reduced. Moreover, when the influence of other predictors was controlled for, every percentage closer the project was to completion, the odds that researchers in the area were networked was three hundred times smaller (Exp β = 0.0034, Wald = 6.020, p=0.014). The confidence intervals for this finding are unusually wide indicating that the decreased likelihood of researchers being networked is anything between 30,000 times and only 3 times less likely.

European added value

In an attempt to quantify the potential added value of the European actions, the regression analysis tested what indicators might predict the overall impact that the FP6 projects have generated. The findings revealed that the type of project instrument and the presence of New Member State partners predicted a high overall impact. This is shown in Table 142: below.

Model parameters		Strength and direction of prediction [Sig. (p<0.05)]		Attribution of impact	
Outcome	Predictor	Individual analysis	Analysis with other predictors controlled for	European Added Value	Structuring of the ERA
High overall impact[20]	I3 project vs. CA or SSA project	?	-	ü	
	NMS partners	?	-		ü

Table 142: Overall impact achieved by projectsOverall impact achieved by projects

The findings showed that I3 projects were approximately three times more likely to have a high overall impact than SSA or CA projects (Exp β = 3.07, Wald = 5.46, p=0.019). Similarly, if New Member States were included as partners, the project was approximately three times more likely to have had a high overall impact (Exp β = 2.97, Wald = 4.94, p=0.026). However, when the influence of other predictors is controlled, these results are not statistically significant. Despite this, the result is an indication of the added value of the European actions by sponsoring I3 activities. It is also contributed to the structuring of the ERA by encouraging the involvement of NMS in projects.

[20] Please refer to end of this document for a technical note on calculating impact scores for which the overall impact is based

Summary

The summary table below indicates overall results for each of the 21 outcome variables, showing which predictors were statistically significant:

- Yellow shading indicates that the predictor was statistically significant for a given outcome in individual analysis.
- Red shading indicates that the predictor was statistically significant for a given outcome in controlled analysis. This means that the predictor remained significant once the influence of all other predictors was controlled for.
- A combination of yellow and red shading for a given outcome variable indicates that the predictor was significant in both individual and controlled analysis.

Outcome (impact) variables	No. of Participants	New member states	Non-EU states	Total EC funding	Total funding	EC funding as % of total funding	Progress towards completion	RTD or INFSO	Project Instrument
Overall impact									
Number of young researchers									
Quality of research data									
Quality of RI services									
Networking of researchers									
Equipment training									
Integrated data sets									
Priority in National research policies									
Industry participation									
Expanded services									
Industry use of RI									
Remote use of RI									
No. of non-European users									
Non-commercial use of resources									
Increased access due to IT quality									
Liaison with local communities									
Improvements in New Member States									
Joint projects with industry									
Generates IPRs/patents									
Generates spin-off companies									
New industrial processes									

statistically significant with controlled analysis	
statistically significant with individual analysis	

Note on calculation of the impact scores

We used the impact section 7 of the project survey to determine impact scores for the projects. All the responses to each project were taken into account in the scoring and each response carried equal weight. Furthermore, all individual questions in section 7 carried equal weight.

If a respondent indicated in his/her answer to a question that something had increased or it was better because of the FP6 funding they received, a score 1 was given. All other answers received a score of 0.

As mentioned earlier, all the responses to each project were taken into account in the scoring. For example, when respondents' answers to a question were mixed for a given project, each of the answers were multiplied by the score (1 or 0) given to that answer. The total score for each question was the sum of all the scores to that question divided by the number of responses for that question.

As mentioned earlier, all the questions carried equal weight. Therefore, the maximum overall impact score that any project could obtain was 8.

Bands for impact score:

High impact score: 6 -8

Medium impact score: 3-5

Low impact score: 0-2

Distribution of impact scores in the sample:

Impact score	Number of projects	Percentage
Low	7	9%
Medium	62	78%
High	11	14%
Total	**80**	**100%**