Performance of SMEs within FP7
An Interim Evaluation of FP7 components

Volume I Main Report

This report has been prepared by a consortium led by Panteia from the Netherlands, consisting of:

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Executive summary

The Interim Evaluation

This is the Interim Evaluation of the participation of Small and Medium-sized Enterprises (SMEs) in the Cooperation Programme and the Research for the benefit of SMEs (RSME) schemes under the Capacities Programme of the Seventh Framework Programme for Research, Technological development and Demonstration activities 2007-2013 (FP7).
FP7 has two main elements in favour of SMEs:

- A commitment to spend at least 15% of the Cooperation Programme budget with SMEs;
- A commitment to SME-specific schemes that aim to strengthen the innovative capacity of low and medium tech SMEs through support for outsourcing R&D (Research for SMEs) and tackling more generic challenges (Research for SME associations).

The overall objective of this interim evaluation is to assess the relevance, efficiency effectiveness of the two FP7 initiatives (the Cooperation Programme and RSME) and their impacts on the participating SMEs and on society[1]. This includes impacts on economic performance and innovation, European Added Value (EAV) and behavioural additionality.
The report is based on several methodologies applied such as quantitative analysis of company financial databases, SME and stakeholder interviews and cases studies across EU28 and beyond. The analysis was guided by the evaluation questions provided in the Terms of References (listed in Section 1.1 of the report).

Here follows a résumé of findings arranged by evaluation theme.

Main Findings

Relevance[2]

Both initiatives score highly with regard to relevance. Pertinent to SMEs but mostly to rather research intensive SMEs. Especially with regard to Research for the benefit of SMEs (RSME) this is a critical remark because the programme aims to target low- to medium-technology SMEs. Secondly Research and Technology Organisations (RTOs) rather often take the initiative for projects in RSME. These projects may still bring benefits for SMEs but they are not in the driver's seat as intended.
Overall it is a point that objectives are nearly all formulated in a rather general way such as "*strengthening the innovation capacity of European SMEs*"[3] and not in a SMART way (i.e. Specific, Measurable, Attainable, Relevant and Time-based) that would not only make it possible to determine whether the objectives are actually reached, but could also be of assistance in implementing more focussed programme criteria and other support actions to reach these goals. The target that 15% of the

[1] Obviously economic effects, e.g. additional employment, are important for society at large. In this report attention is paid to these economic effects on the one hand, and societal effects on the other. Implying that when discussing societal effects with participating SMEs etc. the focus was on the non-economic effects, i.e. improvement in public health or environmental improvements.
[2] Observations with regard to relevance are made in Sections 3.1 for the Cooperation Programme and 5.1 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.1 in Appendix 3.
[3] Corrigendum to Council Decision 2006/974/EC, 19-12-2006, section objectives of RSME, page L 54/109.

budget of the Cooperation Programme should be allocated to SME is a positive exception.[4]
Overall these directional goals are clearly communicated, partly because many different parties in Europe such as National Contact Points (NCPs) and SME associations assist in 'translating' more formal texts of the Commission to reach target groups with a more business like language.

Effectiveness[5]

Both the Cooperation Programme and the RSME scheme have met their targets with regard to participation of SMEs. Notably, the target that 15% of the Cooperation Programme budget should go to SMEs is achieved.
In the RSME scheme, SMEs more often fulfil the role of coordinator, and are more often involved in taking the initiative, as compared with the Cooperation Programme. Albeit there may be a difference between the formal and the actual roles of the SMEs within projects, where the actual role of SMEs may be more passive than foreseen in the project proposal. RTOs are often the prime movers in projects, rather than the SMEs.
For both the Cooperation Programme and the RSME scheme, most participants report more intangible than tangible outcomes; this might be related to the fact that this is an Interim Evaluation, i.e. projects are just finished and it is often too early to have market effects. Figure 1.3 in Section 1.5 of the report shows an overview of R&D-investments and their effects in different moments in time with things like collaboration in phase 1 (short-term) and business opportunities in phase 2 (medium-term). The many intangible outcomes reported, increased knowledge, networking and international contacts, are important as they are instrumental in subsequently reaching tangible outcomes.
The role of SME associations in the Research for SME association scheme is especially important in ensuring relevance and in dissemination.

About one out of ten Cooperation projects is coordinated by an SME[6], and in 66% of the projects in Research for the benefit of SMEs an SME fulfils the role of coordinator. However, more in-depth research show that only 12% of the latter claimed they initiated the project and another 23% were at least part of a joint decision making process[7]. Case studies show that SMEs subcontracting RTOs ideally allow SMEs to define their needs. However, if the RTO took the initiative, this is often not the case. Rather often, SMEs complain that they cannot efficiently impose their needs and requirements on RTOs, who finally dominate the research project. The picture is different with RSME projects that are initiated and dominated by strong and innovation based SMEs. For them, the programme design is optimal, and most efficient, as they can perfectly tailor their demand and can easily access knowledge provided by RTOs. Cases where RTOs invited SMEs to participate do at first glance not correspond to programme objectives in so far as the Research for SMEs scheme should give a better chance to SMEs to pursue their own innovation goals. At second glance, it still appears that also in these cases, SMEs might considerably benefit and increase their innovativeness further, as they gain in confidence and visibility related to their capacities.

[4] Council Decision No. 1982/2006/EC, 18-12-2006, page L412/8.
[5] Observations with regard to effectiveness are made in Sections 3.2 for the Cooperation Programme and in 5.2 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.2 in Appendix 3.
[6] See Figure 3.7 in Section 3.2.3 and Section 5.2.3.
[7] See Section 5.2.3

Efficiency[8]

The great majority of participants judge the initiatives to be an efficiency use of public funds. In Cooperation 64% of participating SMEs state that the benefits already outweigh the costs (and another 27% expect this to happen in future); for the RSME scheme, the current figure is lower: 43% now, however, an additional 42% expect the benefits to outweigh costs ultimately. So the totals – current and future – for the two initiatives are not quite so dissimilar, respectively 91% and 85%.

SMEs are broadly satisfied with various aspects of the management efficiency of the programme. Administrative requirements for application score relatively poorly, but the balance of opinion is still basically positive. In Cooperation 32% (very) satisfactory vs 22% (very) unsatisfactory, and in RSMEs, the figures are a bit lower, respectively 28% vs. 31%. For Cooperation the expected outputs are not very clearly formulated, in RSME the score is better. As one might expect given their respective goals, the Cooperation Programme treatment of SME objectives is very much more diffuse than is the case for the RSME initiative. It might be helpful from a communication perspective if SME specific objectives are described also at a more general level for the Cooperation Programme.

Impacts[9]

The results of the various econometric analyses all show that SMEs participating in the framework programmes score much better than the control group with regard to employment growth and operating revenue for FP7 as well as for FP6.

Also participating SMEs report a range of impacts that have a positive effect on their competitiveness, e.g. more cooperation, new knowledge, improved innovation competences. In Cooperation, 54% of all SMEs report a positive impact on turnover, for employment the figure is 50% and for exports it is 38%. Where participants were able to estimate the degree of improvement, the average increases were substantial: turnover is +22%, employment +25% and export +28%.

In the RSME scheme, 32% of SMEs report impacts on turnover, for employment 30% and exports 27%. Firms reported on average 16% higher turnover, employment and exports. Measurement of economic impacts on participating firms might be improved if enterprises are requested to report some basic performance data when applying for the project and for example 2 and 5 years later.

Very little other effects on society are reported (yet) for either programme.

European Added Value (EAV)[10]

EAV is generally considered to be rather high. EAV is highest for those SMEs located in Member States with low levels of national support for research and innovation. Especially in RSME, participants report a high EAV as these projects provide a framework to international performance that is otherwise out of reach for participating SMEs. International cooperation with access to technological knowledge from abroad is highly valued. Funding from FP7 is often complementary to national funding that might be used as a step to accessing EU funding.

[8] Observations with regard to efficiency are made in Sections 3.3 for the Cooperation Programme and in 5.3 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.3 in Appendix 3.

[9] Observations with regard to impacts are made in Sections 4.1 for the Cooperation Programme and in 4.2 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.4 in Appendix 3.

[10] Observations with regard to EAV are made in Sections 4.2 for the Cooperation Programme and in 6.2 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.5, Appendix 3.

Behavioural additionality[11]

A significant proportion of all participating SMEs report a positive effect on their innovation behaviour. For most aspects, this concerns about 35% of SMEs in the Cooperation Programme[12] and nearly 40% of the SMEs in the Research for SMEs scheme[13]; however in both cases 59% report increased involvement in collaborative research and innovation.

Additionality scores also relatively high. Only a very small percentage of SMEs state that they would have undertaken the project the same way without EC funding (full deadweight effect is only 2% in Cooperation and 4% in the RSME schemes). A significant minority of SMEs report that they would have proceeded with the project in some form, probably with a reduced scope at a later date or would have started searching for other public support. As much as 53% of SMEs in Cooperation and 62% of SMEs in the RSME schemes state they would not have been able to undertake the project at all without EC funding.

Innovation[14]

The majority of participating SMEs has made progress with their innovation plans. Mostly these are (as yet) intermediate results, i.e. new innovation related partnerships, more aware of benefits, indeed managed to work on bringing innovations to the market. In Research for SMEs this score is somewhat higher and in Research for SME associations a bit lower.

In the SME interviews, 70% of SMEs in Cooperation and 67% of SMEs in the RSME schemes report that following participation in the FP7 project they implemented an innovation. These percentages are rather high, but one should keep in mind that innovation is understood by the respondents as being available to the market and not necessarily being successful already. The insight developed from the case studies is that the number of innovations successfully implemented in the market is more modest. Mostly the actual commercialisation only takes place after completion of the FP7 project, and needs considerable additional effort and financing.

[11] Observations with regard to behavioural additionality are made in Sections 4.3 for the Cooperation Programme and in 6.3 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.6 in Appendix 3.

[12] These other aspects are: get involved in research with a longer 'time-to-market', 38%; professionalised its research and innovation activities, 36 %; conduct research and innovation more often, 35% and 32% conduct research and innovation more regularly.

[13] These other aspects are: professionalised its research and innovation activities, 42%; get involved in research with a longer 'time-to-market', 41% ; conduct research and innovation more often, 38%; conduct research and innovation more regularly, 37%.

[14] Observations with regard to innovation are made in Sections 4.4 for the Cooperation Programme and in 6.4 for the Research for the Benefit of SMEs initiative. An overview is presented in Table A3.7 in Appendix 3.

Recommendations

The results summarised above and discussed in more detail in Chapter 3 and 4 for the Cooperation Programme and in Chapters 5 and 6 for the Research for the benefit of SMEs schemes are generally rather positive. However there are some specific issues that may be further improved. Our six recommendations are summarised below. In the full text presented in Section 8.2 more substantiation is included with each recommendation.

1 - Develop overall SME support strategy with clear distinctions between different SME target groups

Retain the SME quota within any future EU applied research programme, as it forces the wider community to recognise the contribution SMEs can make and it contributes to the competitiveness and growth of SMEs. In addition a specific SME strategy should be developed making a distinction between different target groups of SMEs, which acknowledges the different technological positions and different contributions various types of SME can make.

Specific actions that might be taken

1. Develop a proper definition of the type of SMEs that is considered to be the target group of a specific measure. A substantial proportion of participants registered in FP7 as SMEs are consultancies and private technology centres, whereas the primary beneficiaries of public support for SMEs, especially in the Research for the benefit of SMEs schemes, are meant to be SMEs that are participating to solve any issues with regard to their own manufacturing or service process (production processes or products to be marketed). The Commission's monitoring data do not easily reveal the split between consultants[15] and other SMEs, this classification should be improved
2. Define different target groups within the SME population and relate specific programme objectives (for example within thematic priorities) to these target groups.
3. For the SME-specific parts of the programme, really put the focus on non-R&D performing SMEs, when selecting consortia for funding, in order to increase effectiveness of the programme (e.g. to reach specific objectives as making more SMEs oriented towards innovation).
4. Especially firms new to research and innovation support measures might struggle to grasp the goals and rules, so a translation of formal texts into more business friendly language is useful to communicate with the wider business community in Europe that is not yet participating. This to assure a sufficiently high inflow of newcomers. Such efforts are important to avoid that the system develops into a 'closed shop', i.e. only regular participants reacting adequately on calls for proposals as they know the system and the procedures required.

   See also monitoring the share of first time participants among SMEs, mentioned with Recommendation 2.

[15] It is important to distinguish between different types of consultants. One group are for example project management firms that specialise in coordination of FP projects. Another group are (technical) consultants and engineering design firms. They are knowledge-intensive business services (KIBS) and certainly may contribute to innovations.

2 - Collect more information to properly assess type of SME and improve monitoring

The Commission should register various characteristics of participating SMEs that are relevant for future R&D and Innovation support measures such as size, innovation and export performance (as well as growth of these) right from the application phase to assure that the proper target groups are reached.
Enterprises might also be requested to provide such data during and after the closure of the project to provide useful input for monitoring, for example after 2 and after 5 years.

Specific actions that might be taken

1. Monitor for example the share of first time participants among SMEs. Not only classify participants adequately but also monitor the shares of the budgets that go to projects in which SMEs are involved that participate for the first time in an EC funded R&D project (newcomers) and to SMEs that have participated earlier in an EC funded project. A maximum might be specified for the share of participants that are not newcomers and the share of budget that is allocated to them to avoid the programme developing into a closed shop.

3 - Develop objectives that are more SMART, i.e. Specific, Measurable, Attainable, Relevant and Time-based

Clear and concrete ideas should be developed with regard to what constitutes a success or failure of a future R&D and Innovation support measure with regard to SME issues. SMART objectives should be developed in accordance with these ideas so that stakeholders at various levels as well as SMEs themselves are clear on and agree on what is to be achieved by the programme. In addition SMART objectives are important for future evaluations.

Specific actions that might be taken

1. Quantify objectives to a reasonable extent, because it is not necessarily useful in every case. "Goal overload" should be avoided especially because as analysed in the report, efforts to incentivise greater SME participation and specific targets set might also encourage a degree of game playing, with SMEs included in bids for cosmetic reasons, simply to improve the prospects of the proposal in the evaluation process (cf. '*who is in the driver's seat*' with recommendation 4).
2. Clearly formulated objectives should include both strategic and operational aims. Where there are multiple objectives, as in the initiatives evaluated in this Interim Evaluation, the relationship among the different objectives should be clearly described so that they form an integrated and transparent system or hierarchy of objectives.
3. Based on this hierarchy of objectives specific actions and criteria shall be derived, ensuring, that the programmes are implemented in an efficient and effective way, thus, contributing to reaching their respective objectives and the intended impacts.
4. Indicators for monitoring and evaluation derived from this system of objectives can subsequently be formulated, in order to ensure that the programmes will be implemented and its effectiveness and efficiency evaluated in a proper way.

4 - Assure better insight in actual role of SMEs within the projects (are they in the driver's seat?)

The Commission needs to address situations such as those in the Research for the benefit of SMEs scheme where SMEs are not in the driver's seat - as intended by the programme - but taken on board by RTOs only after the proposal has already been developed (See substantiation provided with findings of effectiveness above). More efforts should be made to ensure the formal presentations are in line with the actual situation, are SMEs actually in the driver's seat?

Specific actions that might be taken

1. The Commission might address such situations by adjusting financial procedures, i.e. pay money to each participant directly and not via the project coordinator. As a small company may have difficulties to get the securities – a bank guarantee – for the total project budget, the present practice makes it more difficult for SME to act as coordinator. If, in the RSME schemes, SMEs actually receive the budget allocated to them and subsequently spend this money to outsource R&D to RTOs, they have more possibilities to ensure that efforts of RTOs are indeed focussed on the needs of SMEs and this will have a positive effect on their active interest and involvement; SMEs getting more power to influence the course of events.
2. The Commission and evaluators of the applications should look more closely at project proposals (and contract negotiations) to ensure SME participants are appropriately engaged in the project, and that they remain content with this partnership construction over time.

5 - Include more instruments for commercialisation of project results

For SMEs return-on-investment is crucial for their economic well-being and also for European R&D and innovation support measures, commercial aspects are highly relevant. Therefore the need to support the exploitation of results obtained, especially by SMEs is apparent and should be encouraged in future projects.

Specific actions that might be taken

In order to facilitate / accelerate commercialisation of project results a number of improvements and changes are suggested:

1. Extended and updated PUDK should be made mandatory. Project consortia are required to develop so called Plans for Using and Disseminating the Knowledge (PUDK). However, these often do not reflect the real-world complexity of the commercialisation processes and are of mixed overall quality. Therefore, the PUDK should be extended to reflect the reality of commercialisation processes and the different commercial interests of the project partners. Updates (as the commercial interests of the project partners may change during implementation of the project) and adhering to the PUDK should be made mandatory. In order to further facilitate the development and use of such a strategic document, the Commission should provide and apply a quality standard.
2. Carry out adequate market research. Commercialisation of research results tends to be most successful, prompt and effective if there is knowledge and information about the whole variety of potential markets, customers and applications. Especially for SMEs, the respective costs could be funded as part of the project.
3. Include external expertise on regulation and standardisation. With SMEs' limited market power, standardisation and regulation often prove to be decisive elements for strategies to achieve commercialisation.

6 - Set up support structure for SME associations

SME associations typically represent their members' interests in the economy. They might have limited capacity and capability to lead Research and Technology Development (RTD) projects. Their natural role is the dissemination of project results and communicating their members' needs to the consortium. In order for SME associations to be in the driver's seat, as specified by programme objectives, and to safeguard their members' interests, it is essential that SME associations should be involved in the development of the project idea and influence project progress. To address the generally limited capacity and capability of associations to actually manage RTD projects and to handle Intellectual Property Rights (IPR) issues, specific support should be provided in future projects that are similar to RSME projects.

Specific actions that might be taken

The associations do not necessarily have to coordinate projects but they should be in the driver's seat, i.e. influencing project design and project progress, making sure the project is fulfilling the needs of their members.

To support associations in performing the roles that the programme expects them to have the following actions could be considered:

1. Include management consultancies in the consortia to support associations with managing the overall project.
2. Include technology transfer organisations in the consortia. Associations may not have the right know-how and expertise to see to it that project results get implemented on the market. The involvement of technology transfer organisations may facilitate project results reaching the market, so that a broader range of SMEs can benefit from the results of an association project.
3. Provide assistance with IPR application and management. It should be ascertained that other partners in the consortium/members of the association can use knowledge and technologies developed in the project. Otherwise the fact that the final beneficiary of the results of a project is the sector association remains a weakness in the Research for SME associations scheme.

Concluding remarks

It is of course important to note that FP7 was running from 2007-2013[16]. However the conclusions and recommendations presented in this report are lessons from the Interim Evaluating of FP7. Some recommendations might be considered when implementing future R&D and Innovation support measures, but some elements of the recommendations presented above are still useful for ongoing FP projects in the next 2 or 3 years, i.e.:

- policy officers to keep in touch with other partners in the project than just the coordinator (see recommendation 4 below);
- support commercialisation (see recommendation 5 below);
- support for SME Associations in managing projects (see recommendation 6 below).

[16] The last FP7 calls for proposals were published in December 2013 and the decisions / contract negotiation process for some of the larger more complex projects may take a while. Hence a small proportion of FP7 SME projects might be be ongoing in 2016 and 2017

In addition it should be realised that the fact that a substantial part of the total FP7 project portfolio will conclude one or two years after the launch of H2020 (running from 2014-2012), presents a risk to the programme's ultimate value as officials and the more active participants switch focus to the new programme. This may result in a loss of momentum, and we have seen from our research here that project success (and impact) is contingent on the commitment of the project leadership / partners to exploitation. Hence we also recommend that DG RTD / the Research Executive Agency (REA) seek to protect staffing capacity sufficient to maintain an active 'client' interest in this long tail of FP7 projects, pushing for quality deliverables, end-of-project events and exploring opportunities for follow-on advice or financial support to strengthen commercialisation.

There remains a question about the extent to which the Commission's communication efforts are effective in reaching the full extent of potential SME participants. The number of applicants and participants – by definition, those SMEs that are well aware of the objectives etc. of the programme – accounts for only a few percent of the total research and innovation active SME population. However, the question is to what extent the large majority of SMEs is informed about the programme. Hence it is also recommended to conduct further research into the effectiveness of the various communication activities, as a minimum including additional questions within the annual survey among National Contact Points.

Part I Background

1 Introduction

1.1 The Interim Evaluation

This is the Interim Evaluation of the participation of SMEs in the Cooperation Programme and the Research for the benefit of SMEs' schemes (RSME) under the Capacities Programme of the Seventh Framework Programme for Research, Technological development and Demonstration activities 2007-2013 (FP7).

Schemes to be evaluated in this Interim Evaluation

The Seventh Framework Programme for Research, Technological development and Demonstration activities (FP7) has two main elements in favour of Small and Medium-sized Enterprises (SMEs):

- the aim to enable at least 15% of the funding available under the Cooperation Programme of FP7 to go to SMEs;
- strengthening innovative capacities of SMEs and their ability to benefit from research under the Capacities Programme, two schemes: Research for SMEs and Research for SME associations.

The overall objective of this evaluation is twofold:

- to assess the relevance, efficiency and effectiveness of the two initiatives;
- to assess the impacts on the SMEs participating in the two initiatives and on society[17], including the impacts on economic performance, European Added Value (EAV), behavioural additionality and innovation.

The evaluation results of the two programmes of FP7 are presented in separate parts of the report, thereafter a brief comparison is made.

This Interim Evaluation is implemented by a consortium led by Panteia from the Netherlands with the following other members:

- Technopolis Group with offices in eight countries;
- KMU Forschung Austria - Austrian Institute for SME Research;
- IKEI Research & Consultancy, Spain;
- TEPAV Türkiye Ekonomi Politikaları Araştırma Vakfı (Economic Policy Research Foundation of Turkey), Turkey.

The Tender Specifications listed several evaluation questions for each of the aspects to be evaluated (an introduction to these aspects is given in Section 1.4).

Relevance *(i.e. the extent to which an intervention's objectives are pertinent to needs problems and issues addressed):*

Q1. Are the overall objectives of the two initiatives adequately and clearly specified?

Q2. To what extent are the two initiatives' objectives pertinent in relation to the evolving needs and priorities of SMEs?

Q3. Are the objectives clearly communicated to and understood by the SMEs?

[17] Obviously economic effects, e.g. additional employment, are important for society at large. In this report attention is paid to these economic effects on the one hand, and societal effects on the other. Implying that when discussing societal effects with participating SMEs etc. the focus was on the non-economic effects, i.e. improvement in public health or environmental improvements.

Effectiveness *(i.e. the extent to which objectives set are achieved):*

Q4. What are SMEs' roles in the projects? Are there differences between the different thematic programmes and the two dedicated SME schemes?

Q5. What are the outputs of the two initiatives?

Q6. To what extent has the two initiatives' output contributed to achieving its specific objectives and general objectives?

Efficiency *(i.e. the extent to which the desired effects are achieved at reasonable cost):*

Q7. How economically have the two initiatives' inputs been converted into outputs (input-output ratio)?

Q8. Have the expected outputs been clearly formulated?

Impacts *(i.e. a measure of all significant effects of a development intervention, positive or negative, expected or unforeseen, on its beneficiaries and other affected parties):*

Q9. What have the impacts of the two initiatives been on society and on the participating SMEs?

Q10. How have employment, turnover and profitability (economic effects) of the participating SMEs developed in comparison to the control group?

European Added Value *(i.e. the necessity and added value of EU action):*

Q11. Has the support from the two initiatives resulted in values which are additional to the values that would have resulted from Research and Technology Development (RTD) funded at regional and national levels by both public authorities and the private sector?

Q12. To what extent do actions at EU level complement and enhance the impact of measures taken at national level by governmental and non-governmental (private sector) actors?

Behavioural additionality *(i.e. the effects on the funded SMEs' behaviour and strategy as a result of a government intervention):*

Q13. Have the participating SMEs changed their behaviour as a result of the participation in the two initiatives?

Q14. Have participating SMEs increased their collaboration with new partners at national/
EU level (enterprises, research organisations, universities as a result of participating the project?

Innovation *(i.e. the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations (OSLO Manual)):*

Q15. Have the SMEs participating in the programmes become more innovative, in terms of for example introduction of innovations new to the company or the market?

The Interim Evaluation is based on several methodologies applied such as quantitative analysis of databases, SME and stakeholder interviews and cases studies that are briefly introduced in Section 1.3.

As this Interim Evaluation focusses on Small and Medium-sized Enterprises (SMEs), a brief description of the EU definition of SMEs is provided in Text box 1.1.

Text box 1.1 EU definition of Small and Medium sized Enterprises (SMEs)

"SME" stands for small and medium-sized enterprises as defined in EU law: EU recommendation 2003/361. The main factors determining whether a company is an SME are: number of employees and either turnover or balance sheet total.
The category of micro, small and medium-sized enterprises consists of enterprises which employ fewer than 250 persons and which have either an annual turnover not exceeding 50 million euro, or an annual balance sheet total not exceeding 43 million euro.
Small enterprises are defined as enterprises which employ fewer than 50 persons and whose annual turnover or annual balance sheet total does not exceed 10 million euro.
Micro enterprises are defined as enterprises which employ fewer than 10 persons and whose annual turnover or annual balance sheet total does not exceed 2 million euro.
These ceilings apply to the figures for individual firms only. A firm which is part of larger grouping may need to include employee/turnover/balance sheet data from that grouping too.

Source: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition.

1.2 Structure of the report

This report focuses on the main findings with regard to the various evaluation questions arranged by the different aspects as listed in Section 1.1. As requested in the Tender Specifications this has been done in different parts for the two initiatives studied, i.e. the Cooperation Programme in Part II and the Research for the benefit of SMEs schemes in Part III. Detailed results from the different activities implemented such as case studies and SME interviews are presented in six annexes in Volume II of this report.

PART I Background

Chapter 2 'SMEs in FP7' describes the rationale and objectives for SME participation in the two initiatives of the Seventh Framework Programme (FP7) of the European Commission. The chapter is an introduction to SME participation in FP7 and as such provides the background to the subsequent evaluative parts of the report.

PART II Cooperation Programme

In Chapter 3 findings with regards to the evaluation questions in the areas relevance, effectiveness and efficiency are presented, whereas Chapter 4 focuses on impacts on participating SMEs and society and covers the aspects: impacts, additionality in general, European Added Value (EAV), behavioural additionality and innovation.

PART III Research for the benefit of SMEs schemes

This part has a similar structure as Part II on the Cooperation Programme. Chapters 5 and 6 are the evaluation chapters focusing on the two schemes in the Capacities Programme specially designed for SMEs:

- Research for SMEs;
- Research for SME associations.

Part IV Synthesis

In this part the main findings from Parts II and III are presented and major differences with regard to the two programmes identified. In Chapter 7 overall conclusions are presented, whereas Chapter 8 focuses on opportunities for further improvement in supporting R&D and innovations of SMEs by formulating recommendations.

1.3 Methodologies applied

First a brief overview is provided of the activities implemented. Thereafter some issues are discussed that are relevant for both of the programmes evaluated, the Cooperation Programme in Part II and the Research for the benefit of SMEs schemes in Part III. For example additionality in general and the definition of European Added Value are discussed in this introductory part to avoid covering the same topic twice in Part II and in Part III. In addition to this Volume I there is a Volume II that not only presents more detailed results of the different methodologies applied, but also technical details, e.g. econometric techniques, sampling for interviews, selection of case studies, and questionnaires for SME interviews.

1.3.1 Desk research

In addition to the research tools described below, desk research was carried out with two main objectives:

- identify additional information from websites and publications (see bibliography);
- provide a basis for developing research instruments, such as a checklist for in-depth interviews.

1.3.2 Econometric analyses

The relative performance of Small and Medium-sized Enterprises (SMEs) that have participated in projects of FP7 is investigated in this Interim Evaluation of FP7.
The basic approach to measure impact on the participating SMEs is to:

- compare the business performance before (2006) and after participation in FP7 focusing on three indicators: employment, operating revenue and profit margin;
- compare the performance of this group of participants with a control group over the same period.

As described in Text box 1.2, two specific methodologies[18] have been used: Propensity Score Matching and the Difference-in-Difference method.

Text box 1.2 Propensity Score Matching and Difference-in-Difference approach

The two methodologies used are:

- Propensity Score Matching (PSM), first introduced by Rosenbaum and Rubin (1983), is a statistical method to select a group of non-participating SMEs to construct a control group that resembles the group of SMEs that participated as much as possible. This is done by selecting SMEs having the same chance of participating in FP7 based on characteristics such as country, sector, age of SME, type of SME (autonomous, linked and partner SME), size (in terms of employment, operating revenue) and capital intensity in 2006. If the resemblance between the two groups is acceptable the outcomes observed for the matched group (the control group) approximate the counterfactual. Hence differences in outcomes between the two groups can be attributed to participation in FP7 (more details in Annex 1, Volume II).
- Difference-in-Difference method. This method can be used to compare the SMEs participating in FP7 with the control group on several performance indicators to quantity the impact of FP7. Outcomes are observed for two groups for two time periods. The treatment group is exposed to a treatment in the second period but not in the first period. The control group is not exposed to the treatment during either period. Two differences are calculated. The first difference measures the change in the impact indicator before and after the FP7 programme for both the participating and non-participating SMEs. The second difference measures the difference in the rate of change in the impact indicators between the participating SMEs and non-participating SMEs.

In order to implement these two methodologies, company-level data was needed. The following two existing databases have been used for this purpose:

- eCORDA is a database from the European Commission that contains data on applicants/proposals and signed grants/beneficiaries with regard to a specific Framework Programme for Research. On 7 March 2013 the Consortium received

[18] The Propensity Score Matching method and the difference-in-difference method as applied are described in Annex 1, Volume II.

the datasets from DG RTD of the European Commission. The datasets include information on FP7 Grant Agreements and Participants and FP7 calls for proposals and its applicants from 2007 up to 26 February 2013.

- Information on innovation and business performance of the FP7-participants is not available in eCORDA. Therefore ORBIS, an extensive database of Bureau van Dijk on millions of enterprises in Europe and beyond, was used to supplement business information on eCORDA. ORBIS provides a.o. financial data on enterprises, also on enterprises not included in eCORDA that was used to construct a control group.

The matched database of eCORDA and ORBIS is used for propensity score matching and the Difference-in-Difference method. The database of eCORDA was also analysed to provide answers on the evaluation questions concerning effectiveness. More details on both datasets and on the matching process are described in Annex 1 in Volume II.

1.3.3 Stakeholder interviews

In-depth interviews with relevant stakeholders in the following categories were held:
A. Commission services;
B. European associations of SMEs;
C. European industry associations;
D. Member State SME associations;
E. Member State officials responsible for comparable SME-specific research, development and innovation programmes.

1.3.4 SME interviews

In FP7 about a third of the SMEs are participating in the dedicated Research for SMEs scheme. This has been the basis to opt for dividing the sample of over 400 standardised interviews with SMEs in two strata: about 2/3 focusing on the Cooperation Programme (n=254) and about 1/3 on the Research for SMEs scheme (n=150). SMEs participating in the Research for SME associations scheme were not interviewed. A representative sample across sectors of activity and countries was designed. Thematic priority and country were used as stratification criteria for the Cooperation Programme whereas sector was used for the Research for SMEs scheme. Three different types of countries were distinguished:
A) Member States with low engagement in the Cooperation Programme;
B) Member States with high engagement in the Cooperation Programme;
C) Associated countries.

The interviews were all carried out by the core team and by various researchers from our subcontractors in different Member States. Findings presented in this report are based on weighted results.

1.3.5 Case studies

Three types of cases were distinguished:

- SMEs participating in the Cooperation Programme;
- SMEs participating in the Research for SMEs scheme;
- SME associations participating in the Research for SME associations scheme.

In total more than 150 case studies were done, 145 provided complete information and were included in the analysis:

- 69 cases in the Cooperation Programme and 48 cases in the Research for SMEs scheme, each focussing on one SME participating in an FP7 project. The case studies provide insight in the EAV of the participation, outcome and estimated longer-term impacts. They were also instrumental in understanding motivations,

framework conditions and the concrete functioning of the programmes on the level of SMEs. Case studies rely on several interviews as well as on desk research and data from databases.

- 28 association cases. A "case" is defined as an SME association in a project funded under the Research for SME associations scheme. Also these case studies rely on several interviews, e.g. with the selected SME association, the project coordinator, a Research and Technology Organisation (RTO) and several SMEs, as well as on desk research and data from databases. By the end of 2012, a total of 40 association projects had been completed. This means that the 28 case studies cover 70% of these association projects, almost representing a census. Hence, the 28 cases are considered to be representative of all projects.

When the case studies were carried out, all projects covered by these case studies had been completed, so that outputs and possible impacts could be observed. For each type of case study, a specific research and reporting template was defined. Case studies on SMEs were selected using a purposeful sampling approach zooming into the high variety of situations, to select information-rich cases whose in-depth study would illuminate the questions under study (See Text box 1.3 below).
Only SMEs that have received at least 90 000 EUR of funding are included in the samples. SMEs that took the role of service providers in project coordination, with no ambition in research and innovation, have been excluded.
Cases have been analysed along the key evaluation questions, based on information about the SME (association), its involvement in the project and the benefit it has had from the project. The complete analysis can be found in three annexes in Volume II of this report:

- Annex 4 - Results 28 case studies in the Research for SME associations scheme;
- Annex 5 - Results 69 case studies in the Cooperation Programme plus 48 cases in the Research for SMEs scheme;
- Annex 6 - Show cases, narrative of selected cases. These are narratives highlighting the variety of possible SME involvement in FP7, the context and resulting innovations.

Text box 1.3 Purposeful sampling

The logic and power of purposeful sampling lies in selecting cases from which one can learn a great deal about issues of central importance to the purpose of the research. For example, if the purpose is to increase the effectiveness of a programme in reaching SMEs, one may learn a great deal more by focusing in-depth on understanding the needs, interests, and incentives of a small number of carefully selected groups of SMEs than by gathering standardised information from a large, statistically representative sample of the whole programme. Purposeful sampling aims to select information-rich cases whose study will illuminate the questions under study (Patton, 1990).

There are different logics underpinning sampling approaches in qualitative and quantitative research: qualitative inquiry typically focuses in-depth on relatively small samples selected purposefully, whereas quantitative methods typically depend on larger samples selected randomly.

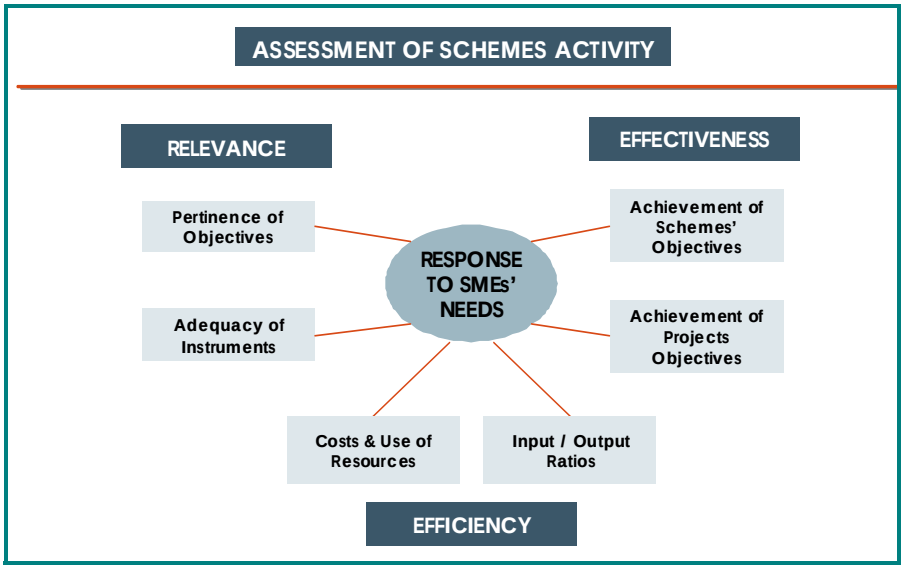
The logic and power of random sampling depends on selecting a truly random and statistically representative sample that will permit confident generalisation from the sample to a larger population. The purpose is generalisation. In contrast, in the context of qualitative social research, scholars sometimes refer to 'analytical generalization'. Analytical generalisation is not generalisation to some defined population that has been sampled, but to a theory of the phenomenon being studied, a theory that may have much wider applicability than the particular case studied (Yin, 2009).

1.4 Introduction to evaluation aspects in Parts II and III

In the second half of this section some concepts are discussed that are relevant for both the evaluation Chapters 3 and 4 on the Cooperation Programme and Chapters 5 and 6 on the Research for the benefit of SME schemes. First a general overview of the evaluation aspects is presented.

This overall objective of this Interim Evaluation is to look into several evaluation aspects shown in Figures 1.1 and 1.2.

Figure 1.1 Relevance, effectiveness and efficiency



1. Relevance

Relevance can be defined as:

- The appropriateness of the explicit objectives of the programme in relation to the socio-economic or technological problems it is supposed to address.
- The extent to which the objectives of a development intervention are consistent with beneficiaries' requirement, country needs, global priorities and partners' and donors' policies.

Consequently, the basic purpose is to assess to what extent the objectives of the two initiatives' are pertinent and properly instrumented in relation to the needs and priorities of SMEs in terms of facilitating an adequate framework (financial means, networks, etc.) for technological development and innovation.

2. Effectiveness

When talking of public policies, effectiveness refers to whether the objectives formulated in a programme are achieved, what the successes and difficulties have been, and how appropriate the solutions chosen have been and what is the influence of external factors. Thus, effectiveness assessments include a measure of all significant effects of the development intervention, positive or negative, expected or unforeseen, on its beneficiaries and other affected parties.

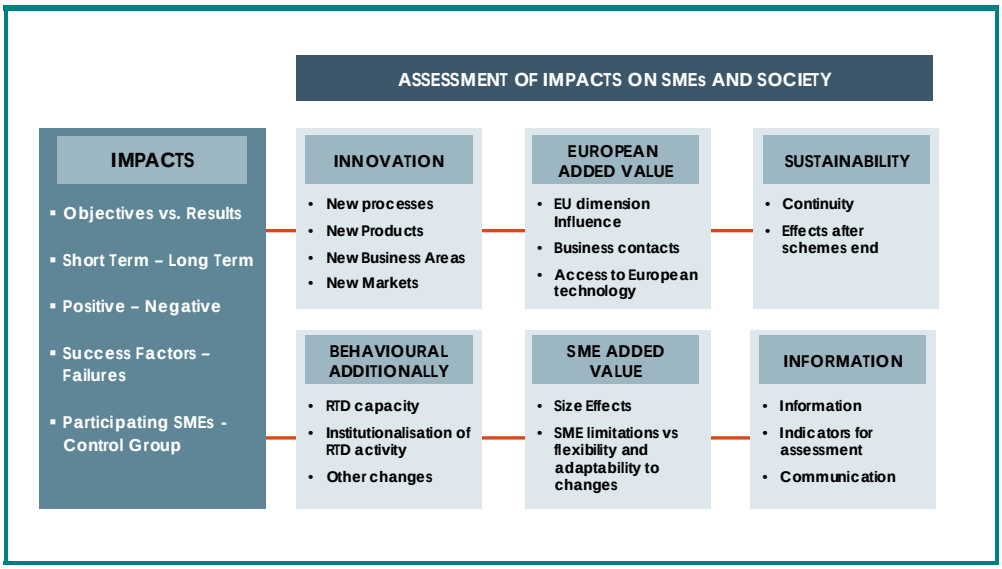
In this sense, the purpose is twofold. Firstly, to evaluate to which degree the general objectives of the schemes have been achieved in terms of budget execution, number and type of projects developed, participation of SMEs (by size, sector, etc.) and SME associations, projects' dimension, etc. Secondly, to assess to what extent the

projects and the participating SMEs and associations have reached their overall objectives (e.g. scientific, financial, exploitation objectives, etc.) and how the projects relate to the objectives of the schemes.

3. Efficiency

Efficiency is a measure of the relationship between outputs, i.e. the products or services of an intervention, and inputs, i.e. the resources that it uses. The efficiency is assessed by comparing the results obtained and the resources mobilised. In other words, are the effects obtained commensurate to the inputs?

Figure 1.2 Impacts on SMEs and society in general



4. Impacts

Impact is a measure of all significant effects of a development intervention, positive or negative, expected or unforeseen, on its beneficiaries and other affected parties. The objective here is to identify and assess all significant effects of the schemes (i.e. the RTD projects developed) on its beneficiaries (SMEs and their associations); other affected parties (RTD performers and others) and where possible on society.

5. Innovation

The evaluation will intend to assess the effects of the schemes on the innovation capacity of participating SMEs, this is to say, to which extent - as a result of the projects - have SMEs increased their ability to create better or more effective products, processes, services, technologies, or ideas that can be subsequently accepted by markets and society in general.

6. Behavioural additionality

Apart from effects such as increased turnover, enhanced productivity, etc. (output additionality) and others such as the induction to SMEs to spend additional resources on RTD (input additionality), the schemes may have supplementary effects on the enterprises' RTD behaviour. This section of the evaluation focusses on the identification of changes in firms' routines, trying to assess if participation in the schemes has made them become more involved in R&D activities and if there have been permanent changes in the conduct of companies and particularly on the institutionalisation of innovation and R&D-activities.

7. European Added Value (EAV)

The focus of this section is on the European dimension of the schemes and the derived results. This is, the effects obtained from the intervention at European level that could not have been obtained if interventions had taken place at regional or national level. For EAV, the establishment of business contacts with SMEs from other countries, the access to technological know-how not available at national level, etc., is relevant.

8. Sustainability

Sustainability is a measure of whether the benefits of a development intervention are likely to continue after external support has been completed (long term impacts). In this sense, the evaluation will intend to assess whether the diverse results and impacts of participation in the schemes are durable over time and if they will continue when there is no more public funding.

9. Information and dissemination

Under this heading a series of operational issues are dealt with, regarding information and indicators for future monitoring and assessment of the schemes, communication with SMEs and dissemination of good practices.

1.5 Selected issues discussed more in detail

All evaluation aspects are introduced in Section 1.4 above. In this section some important elements are discussed in more detail, i.e.:

- additionality;
- European Added Value;
- behavioural additionality;
- becoming more innovative as item to be evaluated;
- time lag challenge in impact assessment.

Additionality

Additionality can be easily defined[19] as "…the extent to which something happens as a result of an intervention (any project, programme or policy that is implemented or supported by the public sector) that would not have occurred in the absence of the intervention". However measuring this is more complicated. It does not suffice to measure something just before and after the intervention, because subjects not affected by the intervention will also show development over time. To tackle this - as in this Interim Evaluation - a Difference-in-Difference method is often applied. This method compares a treatment group and a control group, both before and after the intervention.
A few basic concepts with regard to additionality are presented in Text box 1.4 below.

In the framework of this Interim Evaluation various aspects of additionally are distinguished, e.g.:

- Basic additionality. For example if an enterprise would have undertaken the same actions with regard to R&D and innovations if no public support would have been received, the basic additionality is zero.
- If in absence of the support by FP7, national innovation measures would have supported the enterprises concerned in a similar way, the support as such may

[19] As for example defined in a UK Additionality Guide, a standard approach to assessing the additional impact of interventions, English Partnerships (UK Agency, now Homes and Communities Agency) Additionality Guide, Third Edition, 2008.

result in additionality, but European additionality is not there. See the section below for a more elaborated introduction of EAV.
- Additionality on specific aspects, for example the behaviour of the enterprise concerned in areas of R&D and innovation. If a certain subsidy has resulted in a new production technology applied by the enterprise this may result in additionality in terms of turnover and employment; but if the enterprise does not react differently with regard to opportunities to get engaged in R&D and innovation activities as before, there is no 'behavioural additionality'. See section below.

Text box 1.4 Additionality

Based on a paper from Gerhard Streicher et al. (2004) some basic characteristics of the concept additionality are presented here.

Additionality is the key issue of subsidy-based funding. Additionality implies that government spending does not crowd out but rather stimulates additional private R&D investment. Several different forms of additionality can be distinguished:
- input additionality of R&D subsidies: do public contributions to private research boost total private R&D expenditures - and if so, do they boost them by an amount which is larger than the amount of taxpayers' money which was used in this way?
- output additionality: what is the effect of the subsidies research on a firm's turnover, profit, etc.?
- behavioural additionality: in how far does the existence and availability of public subsidies alter firms' research decisions?

Reactions of own R&D expenditures to a subsidy:
- full crowding out occurs when firms perceive the subsidy as "windfall gains". Firms do not change their R&D plans, but rather use the subsidy to reduce their own spending;
- partial crowding out occurs if firms raise their total R&D expenditures, but less than the amount of the subsidy;
- unchanged level of own R&D expenditures: in this case, the firm uses the subsidy to extend total research by the full amount of the subsidy;
- crowding in. After receiving the subsidy, the firms also increase its own expenditure on R&D. For example the bank perceives the grant as a positive signal, resulting in an extension of the credit line or the R&D grant acts as a stamp of approval for the R&D department that might succeed in obtaining a larger budget share in overall resources of the firm.

European Added Value (EAV)

The Council decision of 19 December 2006[20], starts in the first section with *"…priority should be given to those areas and projects where European funding and cooperation is of particular importance and provides added value".* However it seems that EAV has not a common operational definition. In a report of 2000 on the issue of EAV in RTD support[21] (focusing on FP5), the definition given to start the discussion is *"the value resulting from EU support for RTD activities which is additional to the value that would have resulted from RTD funded at regional and national levels by both public authorities and the private sector".* But there is no operational definition of EAV which facilitates its measurement. The report mainly focuses on reviewing the concept of EAV and its implementation in EU RTD Programme life-cycles and especially on suggesting improvements in the way EAV can be captured. The paper states that it proves rather difficult to conclude that EAV has actually been achieved and the authors state that the main challenge is not arriving at an operational definition allowing measuring EAV but that the primary challenge is to maximise EAV. Hence the paper mainly focuses on programme life-

[20] Decision No 1982/2006/EC concerning FP7.

[21] *Identifying the constituent elements of the European Added Value (EAV) of the EU RTD programmes: conceptual analysis based on practical experience"*; Final Report, Study performed by: Yellow Window Management Consultants SA/NV, Technofi SA and Wise Guys Ltd., commissioned by DG RTD, 20 November 2000 (see: http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/fp5_monitoring_eu_added_value_of_rtd_programmes.pdf).

cycle changes which may optimise EAV. The report suggests selection principles in order to assure activities are EAV-compliant. The prime consideration is that all actions and activities should be aimed at the realisation of one or more high-level EU goals. In addition, they should comply with one or more specific conditions.

Allowable actions and activities are those which:
- are necessitated by the requirements of the Treaty;
- cannot be supported by individual Member States alone;
- help avoid duplication of effort in the Member States;
- complement work conducted within the Member States on issues and problems which have a European dimension;
- are trans-national in character because they require the involvement of participants from different Member States;
- have potential net benefits which are trans-national in character.

It is stated that the concept of EAV is actually a composite of a number of tricky concepts, e.g. the 'EU concepts' of subsidiarity and proportionality, the concept of additionality and the generic - but still difficult to define - concept of value itself.

Also today the concept EAV is not used in a uniform way, as is demonstrated in the following two examples.
In October 2013 the website of DG Justice and Home Affairs[22] of the EC stated, a.o.:
- European projects mean … that at some time the project will have relevance for all the Member States of the EU. The project should generally 'operate' in more than one EU country.
- European added-value includes geographical coverage of a project but most of all analysis and experimentation that leads to recommendations for common models, protocols, guidelines, structures, mechanisms, policies and processes.
- In practice, to build 'European added-value' into a project, it is necessary not only to attempt to run the project in a number of Member States and build multinational partnerships, but also to look beyond the confines of the project to find the broader European relevance of the issues, the actions and the output of the project.

A second example is an explorative study[23] initiated by the Bertelsmann Stiftung and implemented in cooperation with the Centre for European Economic Research (ZEW) in relation to the use of the concept of European Added Value by the Commission when it released its EU budget proposal for 2014 to 2020. According to the EC, added value "is best defined as the value resulting from an EU intervention which is additional to the value that would have been otherwise created by Member States alone". In the opening section of this report, EAV is defined. From an economic point of view, public spending at the European level ideally fulfils two criteria. For one, it should entail positive net benefits, i.e. the benefits should exceed the costs of public spending. Second, it should entail EAV of public spending, i.e. *the net benefits of public spending at the European level should be larger than those at the national level*. In other words, EAV essentially compares the net benefits of spending by national governments with those that arise from spending in the same category at the European level. In this sense, added value is technically the difference between the net benefits of spending at the EU level and the national level. It is important to note that the magnitude of net benefits and EAV are not conceptually connected. For

[22] http://ec.europa.eu/justice_home/daphnetoolkit/html/launching_project/dpt_launching_project_12_en.html
[23] European Added Value of EU Spending: *Can the EU help its Member States to Save Money?* Exploratory Study, 2013 Bertelsmann Stiftung, Gütersloh Germany (see: http://www.bertelsmann-stiftung.de/cps/rde/xbcr/SID-C811381D-433DAAF5/bst/xcms_bst_dms_38323_38324_2.pdf).

instance, even if net benefits are negative, provision at the EU level may still be advantageous.
From the formulation of evaluation question Q11 (see Section 1.1) it is evident that here the formulation as used in the report from 2000 commissioned by DG RTD is still followed.

Behavioural additionality

SMEs innovate less than they might because of the risks involved in developing and commercialising new solutions and because of concerns over the extent to which they can capture enough of the resulting benefits. However, changing the cost of innovation is only part of the story. SMEs need to assign people and resources to these activities, possibly increasing their technical staff, and being prepared to work with third parties possibly even rivals on innovation projects that otherwise make no sense.
The term behavioural additionality has come into general use as the name for this wide-ranging collection of internal changes in attitude, outlook, resourcing and behaviour that one finds in organisations that are becoming more innovative.[24]
Changing SMEs' behaviour around innovation may be more important than the individual innovations made possible by the FP. If behaviour change persists then a greater proportion of European SMEs will be in a position to take forward opportunities revealed through their trading relationships or professional networking: they will be able to appropriate knowledge from any quarter and take advantage of technological externalities.

Becoming more innovative as item to be evaluated

Innovation is a critical intermediate step between the specific objectives of FP7 (accelerating technological advance) and the more challenging goals of Europe's economic strategy, as set out in the Lisbon Strategy at that time.[25] In this (contemporaneous) strategy, innovation is seen as the motor of economic growth and innovation is spurred on when economic actors create or gain access to new knowledge and technology.[26] From this perspective, FP7 ought to produce the knowledge, technology and relationships necessary to contribute to an increase in the quantum of innovation. There is an argument in the innovation literature that smaller firms are more innovative than larger firms and more inclined to pursue radical innovation. Moreover, the literature suggests that these more radical developments have a greater likelihood of transforming economic performance or seeding new economic sectors and so contribute more strongly to longer-term improvements in productivity and competitiveness. By implication, SMEs and their disruptive technologies are more deserving of public support. There are questions about the extent to which all innovations are equally valuable and always make positive contributions to sectoral productivity or customer value, however, the evidence suggests this is true in aggregate notwithstanding the fact that specific cases may contradict this headline.

In Text box 1.5 some findings of a recent study into innovations because of FP7 support are presented.

[24] The original idea of behavioural additionality was arguably driven more by the needs of evaluators and policymakers looking for interesting programme effects they could measure and report to budget holders alongside the more conventional outputs of publications and IP.
[25] The European Parliament website lists the conclusions of the European Council, held in Lisbon 23 and 24 March 2000, setting out an economic strategy for the next 10 years.
[26] Innovation economists believe that what drives economic growth in today's knowledge-based economy is not primarily capital accumulation, but innovative capacity spurred by appropriable knowledge and technological externalities.

Text box 1.5 Innovation by SMEs and impacts on business performance because of FP7 support

In September 2013, an extensive study was published by Science-Metrix Inc. for DG RTD focussing on a performance indicator on SMEs involved in innovation projects under FP7. The idea was to measure the share of participating SMEs that introduced innovations new to the market during or in the three years following completion of the project using an Internet survey (22% response to a questionnaire being based on the Community Innovation Survey questionnaire).

Selected findings

- About 97% of the SMEs participating in FP7 can be defined as innovative enterprises in the period 2010 - 2012 (of which 84%, or 81% of all participating SMEs, can be defined as product-innovative enterprises, i.e. introducing at least one product innovation to the market).
- One of the issues highlighted was that because of the timing of the study some SMEs expressed concern that they could not yet properly report on innovation activities and economic outcomes arising from their (on-going) FP7 projects.
- This study showed that the SMEs participating in FP7 are not representative for the population of SMEs in EU27, but performing well above average. For example the survey showed that for only 42% of the participating SMEs the national market was most important in terms of turnover, and for 28% the European market was most important. The SMEs employ on average some 22 employees and have an average a turnover of about € 2.3 million, which is well above the average for the EU as a whole. The average employment in European SMEs is only some 4 persons.[27] And as much as 97% of the FP7-participating SMEs were defined as innovative enterprises!

Additionality/attribution

- About 50% of the SMEs reporting any innovation in 2007-2012 would have undertaken this also without financial support from FP7; 34% report that they would not have carried out these activities without support. However of the 50% that would have innovated anyway, 60% (30% of all participating SMEs) report that these innovations would have been narrower in scope and 46% (23% of all participating SMEs) declared these innovations would have been delayed.

Recommendations

- The study recommends two types of surveys to be implemented, at project and firm level to capture results and impacts of future EU funding on the innovation activities of supported SMEs. The observation period to be covered is also an important issue. On the one hand the period should not be too long because organisational memory tends to be rather short, on the other hand it needs to be relatively long in order to allow capturing impacts of the participation in the support programme. The authors finally suggest to cover the duration of the programme plus three years (see p. 10 and p. 25 of the report for more details, where also the self-selection bias is considered: SMEs participating in EC innovation programmes might be more innovative and better performing than average right from the start).

Source: Science-Metrix Inc. (2013), Testing Horizon 2020 performance indicator on SMEs involved in innovation projects under FP7, Final Report produced for DG RTD of European Commission, September 2013.

Time lag challenge in impact measurement

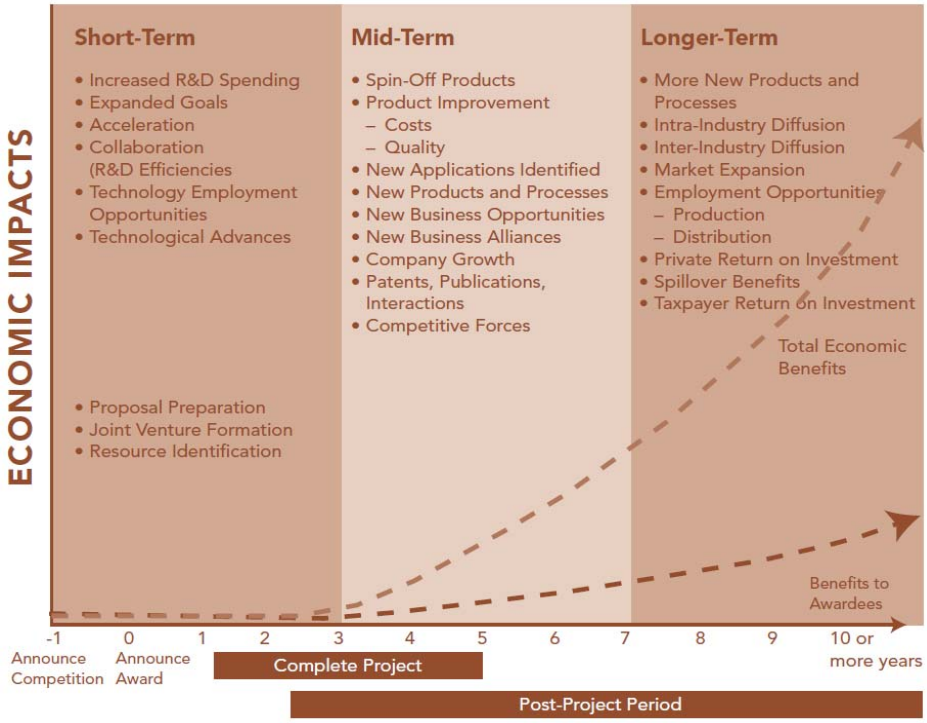
A public intervention as FP7 is mainly focused on pre-competitive research, the process and dissemination of its results. Research projects may take years to become commercially exploited, leading to higher turnover, profitability and employment.

[27] See for example: A Recovery on the horizon? Annual report on European SMEs, 2012/13. European Commission, DG Enterprise and Industry 26-11-2013, Table 2 Enterprises, Employment and Gross Value Added of SMEs in the EU27, 2012.

Different studies point at a serious time lag between the innovation intervention and its impact.[28] There are several time lags between the intervention and the impact of research projects:

- between the use of the initiative and getting results of the FP7-projects itself, hence the lead time of the FP7-project;
- between the specific project results and innovative behaviour and activities like new ideas, new cooperation partners, new products/processes;
- between the innovative outputs and the economic performance. For a part of the projects also the patenting process takes place during this period.

Figure 1.3 R&D-investments and their effects at different moments in time



Source: Ruegg (1999).

Due to these time lags, it is rather problematic to make a full assessment of some of the impacts from FP7-projects already now during this Interim Evaluation. Another reason is that the data of the economic performance of firms becomes available with a delay. At this moment hardly any 2012 performance data are available.[29] For most of the enterprises the latest year available is 2011. Figure 1.3 summarizes the different time lags, and distinguishes between short-term, mid-term and longer-term effects of R&D-projects. This figure originates from an Assessment of the Advanced Technology Program (ATP) in the US by Dr. Rosalie Ruegg (1999). This figure is regularly used in the US, for example in "*Measuring ATP Impact, 2004 Report on Economic Progress*" (NITS 2004), from which the following description originates: Economic impacts are depicted on the vertical scale and time on the horizontal scale.

[28] EC/Regional Policy (2012), Evaluation of innovation activities. Guidance on methods and practices, Brussels; Thomas E. Vass (2008), The three year time lag between innovation collaboration and new product innovation, The Private Capital Market Working Paper Series No. 2008-02-02; Edwin Mansfield (1991), Academic research and industrial innovation, Research Policy, 20, 1-12; Holger Ernst (2001), Patent applications and subsequent changes of performance: evidence from time-series cross-section analyses on the firm level, Research Policy, 30, 143-157.

[29] Only for less than 8% of all SMEs concerned.

A Conceptual Benefits curve starts above zero at the time of competition announcement, implying that there will be benefits from the technology project planning, and from the formation of collaborations stimulated by the announcement. The curve then splits at about mid-project. The lower curve, Benefits to Awardees, shows returns to the project innovators increasing over time as they commercialize or license their technology. This curve remains relatively flat, however, due to such factors as appropriability, or the degree that firms are able to protect the profitability of their inventions. The upper curve, Total Economic Benefits, shows returns to the economy at-large increasing as the technology diffuses to wider use and generates spill overs. The Total Economic Benefits curve veers more steeply upward from the Benefits to Awardees curve as the project nears completion, signifying an expectation of increasing spill over effects over time.

Hence, the time period available in this Interim Evaluation is rather short to measure the (longer-term) impacts, and indicators for mid-term effects are hardly available in the existing databases. However, several activities have been carried out to tackle this challenge, e.g. looking at impacts of projects carried out in FP6
(see Sections 4.1 and 6.1).

2 SMEs and the EU RTD Framework Programme

This chapter of the report describes the rationale and objectives for SME participation in the EU RTD Seventh Framework Programme (FP7), focusing on two of FP7's elements: the Cooperation Programme and the Research for the benefit of SMEs initiative, which is one component of the Capacities Programme of FP7. For readers who would like to understand more about FP7 in general or indeed other parts of FP7 not covered by this Interim Evaluation, please see the Commission's website and fact sheets[30]. This Chapter is an introduction to SME participation in FP7 and as such provides the background to the subsequent evaluative chapters in Parts II and III.

2.1 Rationale for supporting SMEs within the FP

Desk research suggests there continues to be a strong argument for the Framework Programme to address its support to SMEs explicitly, in part to help correct for historical under-investment in research and innovation by this large segment of the European economy and in part to exploit the intrinsic qualities of SMEs, facilitating a step-change in the rate of disruptive, 'game-changing' innovation that smaller firms deliver[31].

There is evidence showing that European SMEs overall are struggling to a greater degree than their counterparts in North America and Japan to play a full and active role in the knowledge economy.[32] The relatively weak performance of private firms, especially SMEs, is one of the key explanatory factors in Europe's relatively weak performance on a range of research and innovation metrics, and all things being equal, can be expected to continue to be a brake on Europe's future ambitions for improving global competitiveness.

In the Europe 2020 Strategy adopted in 2010, one of the five headline targets is that 3% of the EU's Gross Domestic Product (GDP) should be invested in R&D. The EU-27's investment in R&D as a percentage of GDP (2.03%) remains well below the corresponding shares recorded in Japan (3.26%) and in the United States (2.87%)[33], mainly as a result of lower levels of private investment. The greater part of the shortfall relates to the private sector. The share of R&D conducted within the business enterprise sector was equivalent to 1.26% of GDP in 2010, compared with 2.54% in Japan and 2.02% in the United States (both 2009), while the relative importance of R&D investment in the government and higher education sector was broadly similar across all three.

Looking more closely at the data on business expenditure on R&D (BERD), it is clear there is a size issue hiding in the more aggregate statistics, with the largest

[30] The simplest overview of FP7 is provided in a 32-page brochure or 'factsheet,' which describes the programmes basic objectives, principal elements and distribution of funding: FP7 - Tomorrow's answers start today. See also: http://cordis.europa.eu/fp7/home_en.html.

[31] Compare the term 'The process of Creative Destruction', the title of Chapter VII of Capitalism, Socialism and Democracy; Joseph Schumpeter; 1942. He states that dealing with capitalism means dealing with an evolutionary process that can never be a stationary process. The fundamental impulse that keeps the wheel turning comes from new goods, new methods of production etc. This revolutionises the economic structure from within and is continually creating a new order. This process is called Creative Destruction and the term is especially associated with innovation as one of the critical dimensions of economic change. Innovation often creates temporary monopolies and these provide the incentive for firms to develop new products and processes.

[32] O'Sullivan, M. (2008) The EU's R&D deficit and innovation policy, report of the Expert Group on Knowledge for Growth, European Commission, Brussels.

[33] Source: Eurostat. See http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database. Figures for the EU relate to 2010, while for Japan and US they relate to 2010 and 2009, respectively.

businesses investing at broadly similar levels, while smaller businesses in Europe are investing at comparatively much lower levels. Also, US-based SMEs invest on average more in formal R&D than their counterparts in the EU. In 2007, SMEs R&D expenditure amounted to 0.25% of GDP in the EU as compared with 0.30% in the United States.[34]

This relatively low investment in research and development has been a factor (alongside other factors like market size, access to finance and risk appetite) in the relatively poor performance of Europe as the location for high-growth businesses that have driven innovation globally in various new and emerging sectors.

The aggregate figures mask certain sectorial specialisations, too: Europe's R&D performance differential is worse in some sectors and better in others. Recent research (Veugelers, 2010) using the Industrial R&D Scoreboard as published by the Institute for Prospective Technological Studies (IPTS) found quite striking differences in Europe's sectoral R&D specialisation, as compared with the US (e.g. the EU outperforms the US to a large degree in automobiles, electricals, telecom-munications, industrial machinery and various others). In this analysis, the US was shown to have a quite dramatic comparative advantage in several 'emerging' sectors, like biotech, software and the Internet, areas where the world has seen very much stronger rates of growth in the recent past, when compared with several 'older' sectors like automobiles and industrial machinery. The Industrial R&D Scoreboard shows that the list of US top R&D performers is dominated by companies created after 1975, while the EU scoreboard is dominated by businesses founded before 1975. In the US, these "young" innovators account for 35% of total BERD, while in the EU the equivalent figure is just 7%.[35]

This phenomenon does not concern SMEs directly, as these top performers are mostly large multinationals. However, the researchers argue that this outcome does relate to smaller businesses and that it reflects a lower capacity within the EU to create and grow new companies in emerging sectors, a problem that is cumulative. As a result it has arguably led to a situation where the EU's industrial structure overall is less extensive than it might be in many of the most dynamic and fast growing economic sectors. Put simply, most of the world's most famous recent, mega-businesses have tended to begin life in the US, whether that is Apple or Amazon, Facebook or Google, Cisco or Intel, IBM or Microsoft. Veugelers has argued more recently that unlocking growth in Europe will require improved access to finance and markets for innovators as well as further regulatory reform to ensure level playing fields (competition policy and enforcement).[36]

An obvious *prima facie* response to this historical under-performance is to intensify efforts across the EU to encourage and support the emergence and growth of much larger numbers of new-technology based firms. From this perspective, the EU FP Cooperation Programme has an important role to play for younger technology companies, providing scarce investment finance as well as access to global supply chains and markets.[37]

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[34] Innovation Union Competitiveness report, 2011 Edition. See: http://ec.europa.eu/research/innovation-union/pdf/competitiveness-report/2011/iuc2011-full-report.pdf" \l "view=fit&pagemode=none.

[35] Europe's missing Yollies (Young Leading Innovators), Bruegel Policy Brief Issue 2010/06 by Reinhilde Veugelers and Michele Cincera (2010). See http://www.bruegel.org/publications/publication-detail/publication/437-young-leading-innovators-and-eus-r-and-d-intensity-gap/.

[36] How to turn on the Innovation Growth Machine in Europe, Reinhilde Veugelers, KU Leuven, Euroforum, June 2013.

[37] Dewatripont, M., Sapir, A., van Pottelsberghe B., Veugelers, R., 2010, Boosting Innovation in Europe, Intereconomics: Review of European Economic Policy, 45, 5, 264-286 and Bruegel Policy Contribution

Small high-tech start-ups may hold out the promise of quite dramatic growth, and the emergence of tomorrow's superstar firms and household names. However, they are a minority of all SMEs and not the only route to growth in employment or improved productivity. Innovation within the broader SME community, possibly adopting and adapting the new technologies and business models pioneered by the high tech start-ups, has the power to transform whole sectors and deliver increased social and economic benefit more generally.

Research shows us that a small group of SMEs contribute disproportionally to overall growth in employment, so while the small number of superstar firms makes up the very great majority of the headlines in the media, there are significant numbers of these smaller businesses that individually deliver strong, if not stratospheric, growth and together impact on the wider community. These 'unsung' heroes are arguably every bit as critical to the European economy, and as such warrant policy interest. These high performers are often referred to as high-growth SMEs (HGSMEs).[38] Text box 2.1 presents some results of a recent analysis of the importance of HGSMEs within a selection of EU Member States and the US. While there are evident differences between the EU and the US, these are rather variable over time. The bigger 'story' are the differences among EU MS, and the relative importance of HGSMEs within the more dynamic European economies as compared with the less robust. According to the OECD, "High-growth firms are more R&D-intensive than either growing firms or average permanent firms."[39] A study from Canada found that HGSMEs (defined as having sales increase of more than 50% over three years) were more likely to invest in R&D than other SMEs; 34% of HGSMEs invested in R&D activities compared with 25% for other SMEs.[40] While those high-growth businesses are not uniquely correlated with the most research-and innovation active SMEs there is a pretty clear and positive link. As such, an FP initiative to support innovation in SMEs with high-growth potential makes sense. The case for support at the EU level is made very much stronger by the unevenness in performance across EU Member States, as revealed in the former analysis of HGSMEs and in the Commission's own research.

In addition, the Innovation Union Scoreboard 2014 shows that the public expenditure on R&D varies enormously among Member States; with Finland, Sweden, Denmark and Germany at the top and Cyprus, Malta, Romania and Bulgaria at the bottom (see Table A4.1 in Appendix 4). Table A4.2 shows that in the top 4 countries also the business expenditure on R&D is relatively high (top 4: Finland, Sweden, Slovenia and Denmark); also the countries with the lowest score on business R&D expenditure are rather similar: Greece, Latvia, Romania and Cyprus.

2010/06, Bruegel, Brussels. These issues are also touched on in the World Bank's report, Restoring the lustre of the European economic model, Chapter 5: Innovation, (2012), Washington DC.

[38] The recommended OECD/Eurostat definition of high growth enterprises is: "All enterprises with average annualised growth greater than 20% per annum, over a three year period, and with ten or more employees at the beginning of the observation period. Growth is thus measured by the number of employees and by turnover." See for example p. 16 here: http://www.oecd-ilibrary.org/docserver/download/8510041e.pdf?expires=1354696555&id=id&accname=ocid194935&checksum=66D6559E4863D4640FDDD494AEBB3F27.

[39] High Growth SMEs and Employment, OECD (2002). See: http://www.oecd.org/industry/smesandentrepreneurship/2493092.pdf.

[40] Government of Canada, Small Business Financing Profiles, SME Financing Data Initiative, May 2006. See: http://www.ic.gc.ca/eic/site/061.nsf/vwapj/HighGrowthProfile_Eng.pdf/$file/HighGrowthProfile_Eng.pdf.

Text box 2.1 Fast growing firms in Europe compared to the US

The relative number of fast growing enterprises is one of the determining factors of the vitality of the business economy. In a study for the Dutch Ministry of Economic Affairs, Panteia compared Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands and the UK with the US. Fast growth is measured in terms of development of turnover of enterprises with ten occupied persons and more. The definition of a fast growing enterprise follows the OECD definition: having three years in a row at least a growth of 20%, for a three year period the minimum level is hence 72.8%.
For the 9 EU Member States the percentage of start-ups in the period 2009-2011 ranged from 6% (Italy 2011) up to 12.2% (Germany 2010). In Table A the unweighted average for these 9 EU MS is compared with the US.

Table A Number of start-ups as percentage of the total number of enterprises in 2009 - 2011

Country	2009	2010	2011*
Unweighted average 9 EU MS (Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands and the UK)	8.8	9.7	9.1
US	9.4	9.7	9.8

*Source: Panteia. *Note: 2011 are preliminary figures.*

Over these three years the number of start-ups was somewhat higher in US than in the unweighted average of 9 EU MS.
The percentage of fast growing enterprises among the overall enterprise population in these 9 EU MS ranged from 4% (Belgium 2008-2011) to as much as 15% in the UK 2008-2011). The percentage of fast growing enterprise was about equal in the US and the EU in 2006-2009, in 2007-2010 substantially higher in the US and in 2008-2011 a bit lower in the US (Table B).

Table B Percentage of fast growing enterprises in terms of turnover as percentage of the total number of enterprises in 2009 - 2011

Country	2006-2009	2007-2010	2008-2011
Unweighted average 9 EU MS (Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands and UK)	8	6	7
US	8	14	5

Source: Panteia.

The average annual turnover growth of these fast growing enterprises ranged from 30% (Finland, 2008-2011) to 43% (the Netherlands 2008-2011). For annual employment growth the figures ranged from as low as 5% (the Netherlands 2008-2011) to as much as 25% (Italy, 2007-2010).

Table C The annual growth of turnover and employment of fast growing companies in terms of turnover

	Annual growth of turnover		Annual growth of employment	
Country	2007-2010	2008-2011	2007-2010	2008-2011
Unweighted average 9 EU MS (Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands and the UK)	37	34	21	16
US	39	41	15	22

Source: Panteia.

The annual growth of turnover of fast growing enterprises in 2007-2010 was a bit lower in the EU than in the US (Table C). In 2008-2011 it was considerably higher in the US. For annual employment growth of fast growing enterprises (defined in terms of turnover) the US scored comparatively low in 2007-2010; in 2008-2011 the US scored relatively high.

Source: Internationale benchmark ondernemerschap 2013, Tabellenboek (International benchmark entrepreneurship 2013, book of tables), Project carried out by Panteia in a long term research programme on SMEs and entrepreneurship, financed by the Dutch Ministry of Economic Affairs. Panteia 2013 (See: http://www.entrepreneurship-sme.eu/, Document: http://www.ondernemerschap.nl/pdf-ez/A201354.pdf).

The Commission's Annual report on SMEs in the EU, 2011-2012[41], found striking differences in performance across Member States, which was only partly explained by industry structure and underlying demand conditions and suggests that business investment (including research and innovation) and an international orientation had been key to the relative success of two Member States in particular. It concludes that:

> *"Three main factors explain why SMEs in Austria and Germany performed better than elsewhere. First, SME employment is relatively concentrated in high-tech and medium high-tech manufacturing and knowledge-intensive services.*
> *Second, … sectoral labour productivity levels are higher when the sector shows higher investment rates, higher export rates, and when the sector belongs to high-tech and medium high-tech manufacturing and knowledge-intensive services. The best performing countries have generally met these conditions.*
> *Third, the best performing countries have combined SME employment growth with SME labour productivity growth, although the former growth factor has been much higher than the latter."*

The implication of this analysis is clear, businesses and Member States are continuing to under-invest and indeed the financial crisis has made matters rather worse and has increased the gap between the best performers and the rest.

If investment is one factor, international orientation is another key attribute, where businesses and Member States appear to need to work very hard. This perspective is not new of course, however it does play to the core strengths of the EU Framework Programme.

In 2009, the Commission launched a study to map the level of internationalisation of European SMEs, to identify the main barriers and advantages of internationalisation and to propose policy recommendations for improving performance.[42]
Among the conclusions were:

1. SMEs active beyond national boundaries create more jobs and report an employment growth of 7% versus only 1% for SMEs active only in domestic markets.
2. International SMEs are more innovative; 26% of internationally active SMEs introduced products or services that were new for their sector in their country, for other SMEs this is only 8%.

These findings are confirmed by the EUREKA National impact studies[43]. Companies participating in transnational collaboration on market oriented research and innovation projects have a higher growth, employment and export rate than comparable companies without cross-border collaboration on R&D or just participating in national R&D programmes. Additionally, the expertise of the R&D performing SMEs is often so specialised that they have to look throughout Europe to find the best partners with the expertise and resources for joint R&D projects.

[41] ECORYS, EU SMEs in 2012: at the crossroads, Annual report on small and medium-sized enterprises in the EU, 2011/12, Rotterdam, September 2012. See: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/supporting-documents/2012/annual-report_en.pd.

[42] Internationalisation of European SMEs. DG Enterprise, Panteia (before EIM Business & Policy Research). See http://ec.europa.eu/enterprise/policies/sme/market-access/files/internationalisation_of_european_smes_final_en.pdf.

[43] Dutch, Danish, Spanish, French and Israeli studies on EUREKA economic Impact in International Research and Innovation Cooperation (2010-2012). SMEs account for 60% of EUREKA Individual projects participants.

Taken together, these various studies and statistics suggest that there continues to be a case for a pan-EU programme to support SMEs with growth ambitions to expand substantially their investment in research and innovation and their ability to work internationally.

Historically, the FP has engaged with SMEs both through its mainstream collaborative research programmes (the Cooperation Programme within FP7) and its SME-specific schemes (Research for the benefit of SMEs in FP7), where the former is typically targeted on a defined theme and best suited to research-active firms, the latter, is entirely open thematically and supports innovation-active SMEs with lower levels of internal research capacity.

In light of this, the following sub-sections draw on published documents to characterise the SME-related objectives of both the Cooperation and Capacities Programmes in order to understand their alignment with the research and innovation needs of European SMEs. This restatement of the official position has been used in preparing interviews with SME participants and stakeholders.

2.2 The EU RTD Framework Programme

Each successive EU RTD Framework Programme has been larger in scope and ambition than its predecessor, with the Seventh Framework Programme (FP7) being the largest to date, encompassing nearly all research-related EU initiatives. See Appendix 5 in which an evolution of the EU RTD Framework Programme's support to SMEs over time is provided.

With Commission funding of more than € 50 000 million and running over seven years, 2007-2013, FP7 is substantially larger than its predecessor, FP6, and is expected to make a substantial contribution to Europe's knowledge economy and the competitiveness of the European business sector. FP7 is also a key pillar of the European Research Area (ERA), with the programme's transnational actions designed to complement the research and innovation investments of governments across the Member States. FP7 also saw a sharper focus on research excellence and a move towards more fundamental research and away from industrial applications and innovation more generally. This reflects the Commission's parallel expansion of its Competitiveness and Innovation Framework Programme (CIP), run by DG Enterprise and Industry, and with SMEs as its main target.

The evolution continues. On 3 December 2013[44], the Council adopted the "Horizon 2020" programme for research and innovation 2014-2020. Horizon 2020 will replace the EU's 7th Framework Programme for Research (FP7), which ran until the end of 2013. Compared with FP7, the new programme is expected to further eliminate fragmentation in the fields of scientific research and innovation. Horizon 2020 has a budget of around 77 billion euros and will underpin the objective of the Europe 2020 strategy for growth and jobs, as well as the goal of strengthening the scientific and technological bases by contributing to achieving a European Research Area in which researchers, scientific knowledge and technology circulate freely.
The story of SMEs and the EU RTD Framework Programme is similarly dynamic, with lessons learnt in one FP being used to inform the design of the next, in order to increase its relevance to Europe's smaller innovators. This reflects an evident and growing political interest in SMEs in general and a specific interest in doing more to support the innovativeness and growth potential of this large and diverse group of European businesses.

[44] See press release EC at: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/139875.pdf.

With FP5, for example, the Commission recognised the limited relevance of the mainstream thematic programmes to the very great majority of Europe's small firms, and elected to double the support available for SME-specific measures available through FP4. It also launched various accompanying measures for the first time, including an SME web portal and a network of SME National Contact Points. FP6 continued the efforts to improve the alignment between the FP and SMEs, with particular focus on the main thematic programmes, with the introduction of an indicative SME-participation target (10%), the creation of SME-specific instruments, the addition of SME dedicated calls for proposals and topics within broader thematic calls.

With FP7, the Commission introduced several important changes to further improve the relevance of the overall FP to innovative SMEs, including an increase in the level of state aid on offer (up to 75%), more appropriate rules on intellectual property and the simplification of certain administrative procedures. The introduction of a 15% expenditure target for SMEs in the Cooperation Programme, up from a 10% indicative target for 'participations' in FP6, was perhaps the single most important change, which encouraged the thematic programmes within the Cooperation Programme to give greater weight to the involvement of SMEs within their calls and projects. There were fewer changes to the SME-specific measures, albeit there was a substantial increase in its overall and annual budget and the Commission also launched the Eurostars programme in cooperation with Eureka.

The FP's support for innovative SMEs has not always run smoothly. In its original conception, FP7 had no SME-specific measures, but was rather expected to work with SMEs primarily through the mainstream Cooperation Programme. The SME expenditure target was deemed sufficient to ensure the necessary engagement. The European Parliament pressed the Commission Services to retain a dedicated instrument for SMEs, in line with the innovation ambitions and capacities of a very much larger segment of Europe's SME population. This political challenge led to the inclusion of the Research for the benefit of SMEs schemes within the Capacities Programme.

2.3 The FP7 Cooperation Programme

Rationale and objectives

The rationale and objectives for FP7, as well as its constituent elements, are set out in the Decision of the European Parliament and Council concerning the 7th Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013).[45] The Cooperation Programme is the largest single component of FP7, and will invest just over € 32 000 million (65% of the total available budget) across a 7-year term, through a combination of collaborative research and various coordination actions across 10 thematic areas:

1. Health;
2. Food, Agriculture and Fisheries, and Biotechnology;
3. Information and Communication Technologies;
4. Nano-sciences, Nano-technologies;
5. Energy;
6. Environment (including Climate Change);
7. Transport (including Aeronautics);
8. Socio-economic Sciences and Humanities;
9. Space;
10. Security.

[45] COM(2006) 364, Brussels.

The overall objective is to help Europe gain or consolidate international leadership in a wide range of key scientific and technology areas, in order to ensure European competitiveness at the global level.

The specific objectives are set out in the particular work programmes and calls for proposals, as shown in the next quote[46]:

> *"In this part of the 7th Framework Programme, support will be provided to trans-national cooperation in different forms at every scale across the European Union and beyond, in a number of thematic areas corresponding to major fields of the progress of knowledge and technology, where the highest quality research must be supported and strengthened to address European social, economic, environmental and industrial challenges. The bulk of this effort will be directed towards improving industrial competitiveness, with a research agenda that reflects the needs of users throughout Europe. The overarching aim is to contribute to sustainable development".*

The Cooperation Programme does not specify any overall, SME-related objectives. It does however refer to SMEs within the context of its thematic work programmes and does have several rules and operational procedures designed to ensure the programme is relevant to SMEs with the necessary domain knowledge and in-house research capacity. The two most important SME features are:

- a target of 15% FP7 funding to go to SMEs in the Cooperation Programme;
- a 75% funding rate for SME participants, compared to 50% for large companies[47].

In addition, the Commission teams leading the 10 thematic areas have each appointed senior officers to oversee engagement with SMEs.

In developing our thinking about indicators and data collection two issues stand out and have influence:

- Neither the Cooperation Programme nor the Research for the benefit of SMEs (RSME) schemes set out their programme objectives in a way that can be described as SMART, i.e. Specific, Measurable, Attainable, Relevant and Time-based. This makes the evaluation of effectiveness, or even efficiency, somewhat harder. Should the RSME schemes for example commit to deliver a specific quantum of improvement in Business Expenditure on R&D (BERD), to help close the gap with the US? It would be helpful if any future EU-level SME programme were more specific (SMART) as to the outcomes it aims to deliver over the ensuing period. For the current Interim Evaluation, however, use has been made of what one might term 'directional' objectives, relying on our judgement to conclude whether FP7's achievements to date on for example innovation behaviour are sufficient or otherwise.
- The Cooperation Programme views Europe's SMEs as a means to an end, as vectors for change. Its goal is to improve the global competitiveness of Europe's advanced industries, for example, through technological breakthroughs and innovation. The Cooperation Programme is rather neutral as regards the benefits realised by particular groups of actors within Europe's research and innovation landscape, whether that is large firms, SMEs or universities and Research and Technology Organisations (RTOs). As long as the different actors are engaged fairly and productively, the Cooperation Programme does not worry overly about the success or otherwise of its different constituents.

[46] Page 14, COM(2006) 364, Brussels.

[47] Other categories of participants that benefit from 75% maximum funding rate are public bodies, secondary and higher education establishments and non-profit research organisations.

SME participation

The Tenth Progress Report on SMEs' participation in FP7 of June 2013 presents key figures for the Cooperation and Capacities Programmes. For Cooperation, the contract data up to the end of June 2013 show that 5 788 different SMEs had signed one or more grant agreements amounting to 12 414 SME participations (on average 2.1 participations per SME) and attracting € 3 520 million (16.9%) of the total € 20 908 million of EU contributions allocated to the thematic priorities.

Table 2.1 presents the key data for SME participation in the Cooperation Programme, showing the overall budget for Commission contributions for each of the 10 thematic priorities and the contractual commitments entered into up to the end of June 2013. Table 2.1 shows the Commission's contractual commitment to date for the theme overall, for all types of participants including SMEs, the amount contracted with SMEs alone and the SME share of all commitments. In addition the share of each thematic priority in the total Cooperation Programme is presented in the last column. Setting aside the fact that the overall commitments are around 65% of plan with only 6 months of the 7-year programme left[48] (Transport = 46%), Table 2.1 shows that support for SMEs varies widely across themes, from a low of € 23 million for SSH (less than 1% of total commitments to SMEs) to a high of € 943 million for ICT (nearly 27% of total commitments to SMEs). The variance is explained mostly by the differences in the scale of the individual thematic priorities, however there are also differences evident in the level of SME engagement within the individual themes: Nano sciences, nanotechnologies, materials and new production technologies (NMP) and Security have both committed to invest more than 20% of their funding with SMEs, comfortably ahead of the 15% SME target for FP7 overall, while Environment is still some way behind the minimum requirement. SSH is the most striking case, with its commitments to SMEs running at only 5%, which is less than a third of the average for the Cooperation Programme overall.

Table 2.1 SME participation in the Cooperation Programme, by theme and EU contribution (amounts in million euro), EU27 plus association countries

Cooperation Programme Theme	EU budget	EU contribution to all types of participants	EU contribution to SMEs	% EU contribution going to SMEs	Theme's support for SMEs as share of all EU funds allocated to SMEs
Health	6 050	4 001	686	17%	19%
Food, agriculture and biotechnology	1 935	1 433	210	15%	6%
Information & communication technologies (ICT)	9 110	6 337	943	15%	27%
NMP	3 500	2 655	612	23%	17%
Energy	2 300	1 357	256	19%	7%
Environment	1 800	1 371	184	13%	5%
Transport	4 180	1 901	338	18%	10%
Socio-economic sciences and the humanities (SSH)	610	454	23	5%	1%
Space	1 430	521	79	15%	2%
Security	1 350	878	189	22%	5%
Total Cooperation Programme	32 265	20 908	3 520	17%	100%

Note: Based on grant agreements signed up to the end of May 2013.
Source: Table 2 of the monitoring report, SME Participation in FP7, June 2013, EC, DG RTD.

[48] But in July 2013 the European Commission announced a € 8.1 billion package of calls for proposals under the EU's Seventh Framework Programme for Research (FP7), the final and largest ever package of FP7 calls (source: http://ec.europa.eu/research/fp7/index_en.cfm; consulted on 10-11-2013).

Table 2.2 presents the same statistics by EU Member State, and shows a wide variation by country, ranging from almost € 600 million for SMEs with addresses in Germany down to around € 2 million for SMEs in Latvia. The variance in financial commitments is driven largely by differences in the size of the Member State economies. However, when comparing the SME income with all income for the Cooperation Programme, the ranking is turned on its head, with new Member States outperforming EU15 by some margin in proportionate terms. This may reflect the relative strength of the SME community within Estonia or Hungary or possibly the relative strength of the university and research institute sectors within the EU15. In addition existing alternative funding opportunities in some countries (e.g. in Germany) and lack thereof in others will play a role.

Table 2.2 SME participation in the FP7 Cooperation Programme, by EU Member State (EU27)

	Share of total SME contribution	EU contribution to SMEs	EU Contribution to all partners	SME as share of all contributions	Variance from average
Austria	4%	€ 129 617 944	€ 591 177 969	22%	1%
Belgium	7%	€ 209 678 426	€ 957 798 017	22%	0%
Bulgaria	0%	€ 12 018 427	€ 37 354 243	32%	11%
Cyprus	0%	€ 10 979 353	€ 33 590 070	33%	11%
Czech Republic	1%	€ 31 172 334	€ 130 212 217	24%	3%
Denmark	3%	€ 85 923 562	€ 497 352 047	17%	-4%
Estonia	0%	€ 9 958 680	€ 36 062 873	28%	6%
Finland	2%	€ 59 134 350	€ 488 535 383	12%	-9%
France	12%	€ 375 683 493	€ 2 188 330 164	17%	-4%
Germany	19%	€ 595 231 342	€ 3 698 919 864	16%	-5%
Greece	3%	€ 84 468 891	€ 556 327 868	15%	-6%
Hungary	1%	€ 44 539 823	€ 123 591 536	36%	15%
Ireland	2%	€ 64 532 539	€ 295 849 805	22%	0%
Italy	10%	€ 308 287 804	€ 1 933 152 480	16%	-5%
Latvia	0%	€ 1 979 443	€ 15 190 748	13%	-8%
Lithuania	0%	€ 5 068 033	€ 22 230 999	23%	1%
Luxembourg	0%	€ 5 358 637	€ 28 581 793	19%	-3%
Malta	0%	€ 2 344 783	€ 7 937 003	30%	8%
Netherlands	7%	€ 236 820 447	€ 1 496 073 938	16%	-6%
Poland	1%	€ 33 018 801	€ 198 705 252	17%	-5%
Portugal	2%	€ 67 333 470	€ 265 392 562	25%	4%
Romania	1%	€ 18 157 418	€ 71 597 113	25%	4%
Slovakia	0%	€ 12 785 028	€ 39 712 391	32%	11%
Slovenia	1%	€ 23 430 797	€ 92 825 099	25%	4%
Spain	8%	€ 265 490 626	€ 1 568 256 619	17%	-4%
Sweden	4%	€ 114 881 802	€ 834 381 772	14%	-8%
UK	13%	€ 402 181 630	€ 2 654 215 386	15%	-6%
Total	100%	€ 3 210 077 883	€ 18 863 355 211	17%	

Source: Table 3 of the monitoring report, SME Participation in FP7, June 2013, EC DG RTD.

2.4 The FP7 Capacities Programme

Research for the benefit of SMEs (RSME)

The FP7 Capacities Programme includes one SME-specific initiative, Research for the benefit of SMEs, which promotes innovation in European SMEs through support for

applied research and development. The budget for RSME is € 1 336 million[49], which is around one third of the total budget for the FP7 Capacities Programme, and 27% of the target for SMEs in the Cooperation Programme (i.e. € 4 862 million or 15% of € 32 413 million).

The RSME initiative seeks to help SMEs develop new technology-based products or services as a means by which to improve their innovativeness and commercial performance. More specifically, the initiative addresses itself to the large numbers of innovation-active SMEs in Europe with little or no in-house research capability, and provides them with the means to buy bespoke research services from research groups in the public and private sectors. The initiative helps SMEs buy-in more technically demanding research, possibly increase their own research efforts, extend their networks, acquire technological know-how and more generally bridge the gap between the development of novel technological solutions and the introduction of an innovative product or service to the market.

RSME is a complement to the FP7 Cooperation Programme, offering the kind of innovation support relevant to hundreds of thousands of innovation-active SMEs across Europe.

The initiative has two distinct schemes, one of which is designed to support SMEs directly, while the second attempts to address larger numbers of SMEs indirectly through SME associations:

- Research for SMEs. This scheme supports small (transnational) groups of innovative SMEs to acquire new knowledge and contribute to solving their medium-term technological problems. Projects must be centred on the strategic business needs of the SME participants, with the research itself being carried out on their behalf by RTD performers. Projects will typically involve 5-10 partners, extend over one or two years and attract around € 1 million in financial support from the Commission. The scheme is bottom-up; projects may address any technological area and any sector.
- Research for SME associations. This scheme supports SME associations to develop technical solutions to problems common to a large number of SMEs in specific industrial sectors, or segments of the value chain, through research needed, for example, to develop or conform to European norms and standards, and to meet regulatory requirements in areas such as health, safety and environmental protection. Projects, which can have a duration of several years, must be driven by the SME associations which outsource research to RTD performers for the benefit of their members and must involve a number of individual SMEs.

SME participation statistics

The Tenth Progress Report on SMEs' participation in FP7 (June 2013) presents the key figures for both the Cooperation and Capacities Programmes.
For the RSME initiative, the monitoring data (to the end of June 2013) show that 4 417 SMEs had signed 793 grant agreements (5.6 SMEs / agreement on average) attracting around € 850 million of the total € 960 million in EU contributions allocated to all participants. These key figures comprise contributions to both the EU Member States and Associated Countries. The totals for the EU Member States are only a bit lower, just below € 760 million going to SMEs of a total of just over € 860 million, again an SME share of 88%. Table 2.3 shows the participation data for the

[49] Financial means allocated through two schemes: a) Research for SMEs: To support small groups of innovative SMEs to solve common or complementary technological problems and b) Research for SME associations: To support SME associations and SME groupings to develop technical solutions to problems common to large numbers of SMEs in specific industrial sectors or segments of the value chain (DECISION No 1982/2006/EC).

FP7 RSME initiative, up to the end of June 2013, by EU Member State. Table 2.3 also shows the EU contributions to SMEs and to all participant types, with the SME share ranging from 80-90%, which underlines the focus on support for SMEs. However it should be noted that - in contrast with for example the Cooperation Programme - these funds do not 'remain' with the SMEs, they are mainly spent to finance research done by RTOs. The statistics are however not a good proxy for the split between firms and research organisations, as many of the latter are also small, privately owned firms, i.e. SMEs.

Table 2.3 SME participation in the FP7 RSME initiative, by EU Member State

EU27		EU contribution to SMEs		EU contribution to all participants	EU contribution to SMEs as perc. of total
Austria	2%	€ 13 445 895	2%	€ 16 894 300	80%
Belgium	3%	€ 25 257 133	4%	€ 32 274 064	78%
Bulgaria	1%	€ 7 666 504	1%	€ 8 700 555	88%
Cyprus	1%	€ 6 782 329	1%	€ 8 023 419	85%
Czech Republic	2%	€ 13 318 603	2%	€ 14 284 342	93%
Denmark	3%	€ 25 647 931	3%	€ 29 603 783	87%
Estonia	1%	€ 9 069 802	1%	€ 9 634 003	94%
Finland	2%	€ 13 450 364	2%	€ 14 886 941	90%
France	7%	€ 53 837 620	7%	€ 58 920 743	91%
Germany	10%	€ 75 287 830	10%	€ 88 605 674	85%
Greece	4%	€ 26 825 355	4%	€ 31 005 644	87%
Hungary	1%	€ 10 938 455	1%	€ 11 967 965	91%
Ireland	3%	€ 25 441 883	3%	€ 27 601 953	92%
Italy	11%	€ 79 791 295	11%	€ 91 689 713	87%
Latvia	0%	€ 1 528 909	0%	€ 1 724 041	89%
Lithuania	1%	€ 7 018 203	1%	€ 7 894 612	89%
Luxembourg	0%	€ 1 326 088	0%	€ 1 549 744	86%
Malta	0%	€ 3 338 072	0%	€ 3 482 435	96%
Netherlands	4%	€ 30 052 536	4%	€ 34 797 076	86%
Poland	2%	€ 16 152 837	2%	€ 17 730 777	91%
Portugal	2%	€ 16 884 075	2%	€ 18 895 889	89%
Romania	1%	€ 9 945 451	1%	€ 10 688 451	93%
Slovakia	0%	€ 1 903 549	0%	€ 2 198 356	87%
Slovenia	1%	€ 9 273 550	1%	€ 10 768 959	86%
Spain	16%	€ 121 519 534	15%	€ 132 336 618	92%
Sweden	3%	€ 20 767 425	3%	€ 24 401 408	85%
UK	17%	€ 132 313 382	18%	€ 150 938 460	88%
Total		€ 758 784 610		€861 499 925	88%

Source: Figures taken from Table 47 of The Tenth Progress Report on SMEs' participation in FP7 (June 2013), EC DG RTD.

Table 2.3 shows that four or five EU Member States are particularly active within the initiative, with SMEs located in Spain and the UK having together secured more than 33% of RSME total commitments to date, with France, Germany and Italy together accounting for a further 28% of the investments. The figures may overstate the geographical concentration because of the inclusion of RTOs within the SME figures on the one hand, and because the Research for SME associations scheme is producing outputs for their SMEs members and the wider business audience that are not direct participants and are therefore not reported in these data.

Part II Evaluation of the Cooperation Programme

This part of the evaluation report presents the evidence gathered with regard to the evaluation aspects of the Cooperation Programme based on various sources and methodologies as described in Section 1.3.

- relevance, effectiveness and efficiency in Chapter 3;
- impact, additionality (European Added Value (EAV), behavioural additionality) and innovation in Chapter 4.

The maximum overall amount for Community financial participation in the Seventh Framework Programme was determined to be € 50 521 million of which € 32 413 million or 64% was allocated to the Cooperation Programme.[50]

Section 3.2 hereafter shows that in the period 2007 - February 2013 5650 projects have been started. In total there have been 64 508 participations (not unique organisations as some participate in more projects) of which 11 952, or 18.5% are SMEs.

[50] European Commission (2006), Decision No 1982/2006/EC.

3 Relevance, effectiveness and efficiency of the Cooperation Programme

3.1 Relevance

Relevance refers to the extent to which an intervention's objectives are pertinent to needs problems and issues to be addressed. If the objectives of an intervention indeed address the needs, problems and/or issues identified, the intervention strategy can be judged as respecting this criterion.[51] So the issue is whether the Cooperation Programme of FP7 is indeed linked to the actual needs of the SMEs business community.

The evaluation questions in this area are:
Q1. Are the overall objectives of the initiative adequately and clearly specified?
Q2. To what extent are the initiative's objectives pertinent in relation to the evolving needs and priorities of SMEs?
Q3. Are the objectives clearly communicated to and understood by the SMEs?

Findings on relevance of the Cooperation Programme

1. The Cooperation Programme is clearly relevant to SMEs, there are almost 12 000 SME participations (19% of all participations). Still the Cooperation Programme is addressing only a small part of the large community of European SMEs (some 20 million).
2. Participating SMEs are well aware of the objectives of the programme they participate in. Especially cooperation, innovation, competitiveness and knowledge are mentioned by the SMEs as main objectives of the programme. Also the main motivations of the SMEs to participate are in line with the objectives of the programme.
3. The Cooperation Programme fits rather well to the needs and priorities of the SMEs. However, it seems to fit best to SMEs that are relatively innovative and already engaged in R&D.
4. Communication seems to be a limiting factor in reaching out to a sufficient large part of the 20 million SMEs in Europe. Presently national stakeholders like the National Contact Points (NCPs) are putting in a lot of efforts to translate text from the Commission in a business friendly format and seem to reach the relevant business community rather well. However, much efficiency could be gained if this would not have to be done in each country separately.

3.1.1 Programme objectives and relevance for SMEs

No specific attention to SMEs in the objectives of the Cooperation Programme overall and at thematic level

The overall objectives of the FP7 Cooperation Programme (see Text box 3.1) are silent as regards the specific needs of Europe's SMEs, and are concerned rather with Europe's global competitiveness more generally. In that sense, the Cooperation Programme's overall ambitions for SMEs are not clear.

[51] See: Evaluating EU Activities, a practical guide for the Commission services, July 2004; (http://ec.europa.eu/dgs/secretariat_general/evaluation/docs/eval_activities_en.pdf).

Text box 3.1 Objectives Cooperation Programme

For the Cooperation Programme € 32 413 million out of the overall budget for FP7 of € 50 521 million is reserved (64%).

"In this part of FP7 support will be provided to transnational cooperation in different forms across the Union and beyond, in a number of thematic areas corresponding to major fields of knowledge and technology, where the highest quality research must be supported and strengthened to address European social, economic, environmental and industrial challenges. The bulk of this effort will be directed towards improving industrial competitiveness, with a research agenda that reflects the needs of users throughout Europe. The overarching aim is to contribute to sustainable development".

Ten themes are defined.

"These themes are broadly defined at relatively high level, such that they can adapt to evolving needs and opportunities that may arise during the lifetime of FP7. For each of them, a series of activities has been identified which indicates the broad lines envisaged for Community support. These activities have been identified on the basis of their contribution to Community objectives, including the transition to a knowledge-based society, the relevant European research potential and the added value of Community level intervention for these subjects. Special attention will be paid to ensuring there is effective coordination between the thematic areas and to priority scientific areas which cut across themes, such as forestry research, cultural heritage, marine sciences and technologies. Multidisciplinarity will be encouraged by joint cross-thematic approaches to research and technology subjects relevant to more than one theme, with joint calls being an important inter-thematic form of cooperation".

…

"This Framework Programme will contribute to the realisation of these Strategic Research Agendas where these present true European added value. European Technology Platforms, with the possible participation of regional research driven clusters, can play a role in facilitating and organising the participation of industry, including SMEs, in research projects relating to their specific field, including projects eligible for funding under the Framework Programme."

…

"Particular attention should be paid to ensuring the adequate participation of SMEs, in particular knowledge-intensive SME in transnational cooperation. Concrete measures, including support actions to facilitate SME participation, will be taken throughout the 'Cooperation' part of the programme in the framework of a strategy to be developed under each theme. These strategies will be accompanied by quantitative and qualitative monitoring against the objectives set. The aim will be to enable at least 15 % of the funding available under the 'Cooperation' part of the programme to go to SMEs".

…

"Raising the competitiveness of European research requires that the potential across the whole European Research Area is fully unlocked. Projects, aiming at providing scientific excellence, should be managed optimally with particular regard to the use of resources. Across all these themes, support for trans-national cooperation will be implemented through: (a) Collaborative research, (b) Joint Technology Initiatives, (c) Coordination of non-Community research programmes, (d) International cooperation.

Collaborative Research - Collaborative research will constitute the bulk and the core of Community research funding. The objective is to establish, in the major fields of advancement of knowledge, excellent research projects and networks able to attract researchers and investments from Europe and the entire world. This will be achieved by supporting collaborative research through a range of funding schemes: collaborative projects, networks of excellence, coordination/support actions".

…

"International cooperation actions, showing European added value and being of mutual interest, under this part of the Seventh Framework Programme will be: (a) actions designed to enhance participation of researchers and research institutions from third countries in the thematic areas, with appropriate restrictions for the security theme due to the confidentiality aspects, accompanied by strong efforts to encourage them to seize this opportunity. (b) Specific cooperation actions in each thematic area dedicated to third countries where there is mutual interest in co-operating on particular topics selected on the basis of the scientific and technological level and needs of the countries concerned. Closely associated with the bilateral cooperation agreements or multilateral dialogues between the EU and these countries or groups of countries, these actions will serve as privileged tools for implementing the cooperation between the EU and these countries. Such actions are, in particular, actions aiming at reinforcing the research capacities of candidate countries as well as neighbourhood countries and cooperative activities targeted at developing and emerging countries, focusing on their particular needs in fields such as health, including research into neglected diseases, agriculture, fisheries and environment, and implemented in financial conditions adapted to their capacities.

This part of the Framework Programme covers the international cooperation actions in each thematic area and across themes. Such actions will be implemented in coordination with those under the 'People' and the 'Capacities' programmes. An overall strategy for international cooperation within the Seventh Framework Programme will underpin this activity."

Source: DECISION No 1982/2006/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013).

The situation is broadly similar at the level of the individual thematic priorities, with the overarching descriptions of each theme focusing on the global objective of improved European competitiveness. By way of example, the following is an excerpt from the Cordis web pages for the FP7 ICT programme, the largest of the ten thematic priorities:

> *"The objective of ICT research under the EU's Seventh Framework Programme (FP7) is to improve the competitiveness of European industry - as well as to enable Europe to master and shape the future developments of these technologies so that the demands of its society and economy are met".*[52]

The thematic priorities are challenge-led, and in that respect, their headline objectives are participant-blind: while they may benefit many SMEs or other types of organisations, sponsoring particular constituents is not central to their raison d'être.

… but in the Work programmes reference to SMEs is made

The Work Programmes for the Cooperation themes do make explicit reference to SMEs, albeit the ambition is generally to make best use of the requirement to increase SME participation within the themes. The ICT Work Programme 2013 is a good example. It is well structured and clearly written, albeit 170 pages long, it would be hard to describe it as an 'easy read.' Its opening chapters outline the strategy for the closing stages of FP7 (and commencement of H2020), with one sub-section committing to involve more SMEs. The following extract underlines the particular role of innovative SMEs in this domain, which is to say, they tend to be more radical in their thinking and able to move forward very much more quickly than larger businesses or public agencies:

> *"SMEs are at the heart of innovation in ICT. They play a vital role with their capacities to generate new ideas and quickly transform these into business assets. This Work Programme provides major opportunities for innovative SMEs, both to finance R&D and innovate in their products and services offering, and to build strategic partnerships and operate in wider markets".*

The Work Programme also presents an overview of the forthcoming calls for proposals, with more than 60 planned across the eight ICT challenge areas and four other strands (e.g. Future and Emerging Technologies). SMEs are referred to directly in around 20% of the call descriptions, with several calls targeting SMEs specifically. Objective ICT-2013 4.3 is a case in point, SME Initiative on Analytics, which is intended to help:

> *"European Small and Medium Enterprises acquire the competences and resources they need to develop innovative content and data analytics services. Development of services based on the use of available data, particularly from public bodies, is specifically required for theme a) and encouraged for theme c)".*

Sampling different thematic work programmes reveals a broadly consistent picture, with reasonably frequent but passing references to SMEs in a significant minority of calls, and a rather better and clearer presentation of SME objectives in the small minority of calls addressed to SMEs specifically.

The importance of SME participation to meet the objectives in the view of stakeholders

Interviews with stakeholders reveal that the individual thematic areas have quite specific views as regards the contribution of SMEs, however in general this is a question of what SMEs can bring to the programme rather than what the programme can bring to SMEs. So, for example, in several thematic areas, SMEs are seen as a

[52] http://cordis.europa.eu/fp7/ict/.

critical part of the value chain - whether they are supplying intermediate goods or delivering final services - and there are technologies and methodologies that they own uniquely and which must be developed and adapted for more systemic innovation to occur.

Elsewhere, one sees SMEs as the entrepreneurs, the source of radical new technologies and associated products and services, which larger enterprises simply cannot deliver. In both cases, SMEs are seen as a key actor in the innovation ecosystem and a necessary contributor to the realisation of the programme's technological and European objectives.

Awareness is increasing that SMEs deliver an important contribution to innovation

The stakeholder interviews reveal substantial progress from FP6 to FP7 in the understanding among the Commission Services as to the unique contribution that SMEs can make to innovation and technological advance within a given domain.

The Cooperation Programme is relevant for Europe's SMEs …

The simplest test of a programme's relevance or pertinence to a particular constituency is the level of interest shown in the scheme by enquirers and the volume of applications. The Cooperation Programme is clearly relevant to SMEs. As the Commission's monitoring data show the programme has entered into contracts with many thousands of SMEs (19% of all participations), and together those organisations will benefit from an investment of more than € 3 500 million (up to June 2013) or 17% of the total EU contribution.

These results are in line with our analyses of the eCORDA dataset. Further details on the output is described in section 3.2 in which the effectiveness is assessed.

The SME share of Cooperation Programme contributions looks reasonable when compared with the share of Business Expenditure on R&D accounted for by Europe's SMEs, which was around 20% in 2008.[53] Comparison with general SME statistics, however, presents a slightly different picture.

The Cooperation Programme is addressing a small elite and has no relationship with the great majority of Europe's 20 million SMEs (EU27), that account for over 99% of all businesses, two thirds of private-sector jobs and more than half of the value added created by the business sector (about 58%). Around 85% of the SMEs are active in manufacturing and services.[54]

… but the number of SMEs participating might be too small to have an effect on R&D and innovation needs of European's SMEs in general

There are detractors, too. Policy makers and experts who say the Cooperation Programme is pertinent to such a tiny fraction of Europe's SMEs that it is hard to argue its relevance in any strategic sense. These critics reason that making the Cooperation Programme more SME-friendly may help the programme deliver on its objectives, which is a good thing, however they doubt such refinements can reach a

[53] See: Figure II.1.2 in: Innovation Union Competitiveness Report 2011, http://ec.europa.eu/research/innovation-union/pdf/competitiveness-report/2011/iuc2011-full-report.pdf#view=fit&pagemode=none.

[54] See: A Recovery on the horizon? Annual report on European SMEs, 2012/13. European Commission, DG Enterprise and Industry 26-11-2013. http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/supporting-documents/2013/annual-report-smes-2013_en.pdf.

point where the initiative can satisfy the research and innovation needs of Europe's SMEs more generally.
The relevance of the Cooperation Programme to Europe's SMEs is reinforced by the academic and policy literature, which include conceptual studies about the critical importance of small innovators in the emergence of new economic sectors and also transforming sectors, as described in more detail in Chapter 2 of this report.

Cooperation Programme in particular relevant for research intensive SMEs

The stakeholder interviews also reveal a pretty consistent view of the Cooperation Programme and its relevance to a minority of SMEs, generally with pre-existing, in-house research capacity. Stakeholders see SMEs as being an important class of actors in the area, and also believe - in line with the academic literature - that a European programme offers the kind of platform whereby participating SMEs enhance their prospects of growing into one of Europe's large employers, in the fullness of time. They see the Cooperation Programme's support for high-tech SMEs as being relevant to Europe's longer-term industrial development and sustained growth and competitiveness.

The case studies provide an insight into the growth and innovation strategy of SMEs, as well as into some innovation patters. Case studies also underline the observation, that the FP7 Cooperation Programme attracts in particular research intensive SMEs. For this group, case studies confirm that the Cooperation Programme's initiatives fit rather well to the needs and priorities of the SMEs. An assessment by the case studies' authors of 65 case studies in the Cooperation Programme results in a high score. Relevance is particularly high in the priorities Health and ICT. Seven of nine case studies conducted with SMEs participating in the FP7-Health project show very high relevance. Indeed, Cooperation projects open the possibility to SMEs to engage in longer term research, and to access relevant knowledge in complementary technology fields. Secondly, 22 out of 28 case studies show that FP7-ICT projects are highly (12) or very highly (10 cases) relevant for SMEs. In this field, it is not so much the long-term perspective of research but the very rapid technological change that forces front-edge SMEs to keep in the loop and continuously invest in cooperative R&D. In the other priority areas of the Cooperation Programme, relevance is assessed as slightly lower but still keeps well above a medium score with 17 cases showing high or very high relevance compared to 11 cases with medium or low relevance for SMEs.[55]

Taking a closer look at participating SMEs, it turns out that the Cooperation Programme fits best to SMEs that are particularly innovative, engaged in R&D, and benefit from internationalisation, high funding rates and cooperation.[56] R&D has a core position in the innovation and growth strategy of these SMEs, which often started business as spin-offs of Research and Technology Organisations (RTOs), universities or research departments in multinational industrial companies. Moreover, many of the SMEs studied in the case studies started business rather recently: one third of the observed SMEs participating in the Cooperation Programme were created in 2004 or later. For participants in the ICT priority, this even holds for nearly half of the observed SMEs (14 of 30), while in Health, all but one SME have been created in 1999 or later, four of them in 2005 or later.

Due to high funding rates, project size and the international dimension, FP7 is very attractive for these innovation oriented SMEs and they are well aware of the initiatives' design.

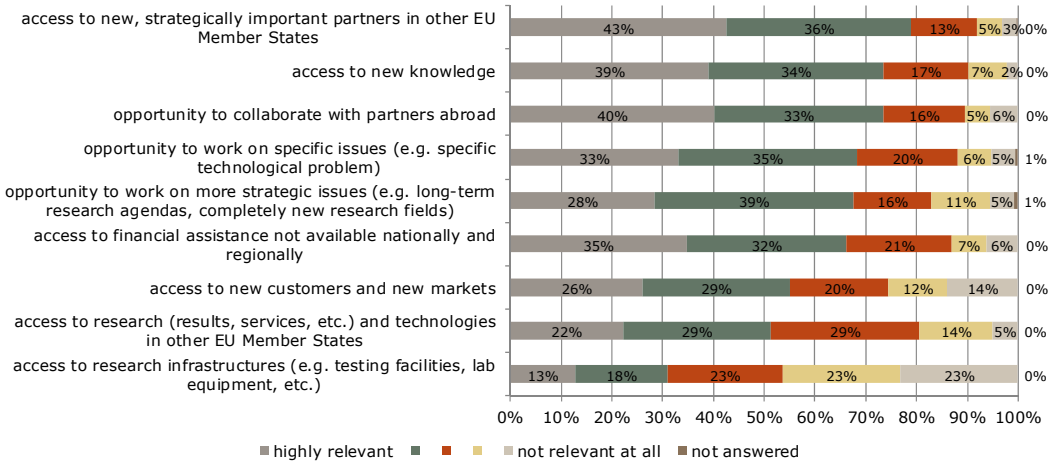
[55] More details emerging from the case studies are given in Annex 5 in Volume II.
[56] See a.o. Text boxes 1, 2 and 3 in Annex 5 in Volume II.

3.1.2 Motivation to join, awareness of objectives and communications

Main reasons for SMEs to participate are partner & collaboration issues and access to knowledge

An additional view on the relevance of the Cooperation Programme for SMEs is obtained by looking at the motivation of SMEs for their participation in the projects as this also indicates to which extent the objectives of the programme are pertinent in relation to the needs and priorities of SMEs. Figure 3.1 based on the SME interviews shows that partner and collaboration issues together with access to new knowledge are the most relevant motivations to participate in the Cooperation Programme. This clearly is in line with the objectives of the programme.

Figure 3.1 Motivations for participation in the Cooperation Programme



Source: Austrian Institute for SME Research 2013 (254 SME interviews; weighted sample).

Participating SMEs are aware of the objectives of the programme

The SME interviews show that the items most frequently mentioned by SMEs in the interviews when asked about the objectives of the programme results in the "word cloud" presented in Figure 3.2. This is a diagram that gives greater prominence to concepts that appear more frequently in the answers of the SMEs. The result is in line with the actual objectives of the programme, as 79% of the answers given match with the actual programme objectives.

Figure 3.2 Programme objectives as named by SMEs interviewed (Cooperation Programme)

Correct responses in relation to each other (counts), clustered answers boiled down to their core meaning.
Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

Communication should be further improved, in particular for new applicants

To be successful, any research and innovation programme needs to be both relevant to and easily understood by those people and organisations it aims to attract and work with, in pursuit of its social objectives. There is a long-standing anxiety that European RTD Framework Programmes perform poorly in terms of the clarity of communication and that this is especially problematic for smaller organisations, public and private, with no requirement or capacity to follow developments in Brussels.
Feedback from interviews with various National Contact Points (NCP) suggests the Commission's communication style is indeed confusing for the unfamiliar and that there is a perceived risk that at least some proportion of all innovative SMEs may overlook the programme altogether or fail to grasp its relevance to their situation.

Member States officials, NCPs and intermediaries indicate that the programme documentation, supporting work programmes and calls for proposals all tend to be overly long and rather technical in their use of language. The careful and comprehensive cross-referencing to official texts, communiqués and directives adds complexity too, and makes it harder for readers to feel confident in their understanding without having to read more widely among even more challenging texts. NCPs and intermediaries tell us that *"SMEs want to know what kind of help is available, to which types of organisations and on what terms."* The NCPs also tell us that their (the NCPs) presentations do provide SME audiences with heavily abridged material, focusing on the critical points and short-circuiting the longer texts and avoiding technical language, while gently guiding people in their wider reading.

This concern is arguably less of an issue for the Cooperation Programme, given its focus on high-tech SMEs, but nonetheless it was stated that firms new to the scheme struggle to grasp the goals or rules. As mentioned in several stakeholder interviews, that steep learning curve also reveals itself in the higher failure rates among first time applicants.

Better communication may lead to more applications and probably a better portfolio of projects

While several people stated in the stakeholder interviews that there are no doubt numerous high-tech SMEs that are unaware of the FP7 Cooperation Programme, they will be widely distributed and the additional cost of finding them would be high. There would also be an attendant risk, with the implied substantial increase in communication activity, of producing a spike in applications from businesses for which the Cooperation Programme is not wholly suitable. Attracting more applicants would inevitably reduce the success rates overall, and one would need to be confident that such efforts would strengthen the programme portfolio - through competition and improved choice - and thereby deliver increased social value to offset the additional costs.

No one consulted could estimate the size of this potentially missing segment, of unaware or sceptical SMEs, nor offer a good view on any wider implications for the programme or EU competitiveness.

There is a general sense that the importance of communication is recognised by the Commission Services, and that the situation has improved over time: messages are simpler and designed to address a lay audience and more communication channels and media are being mobilised. Moreover, the intermediary structures are well-established and continuously broadcast easy-to-grasp information and invite prospective applicants to come along to events or otherwise get in touch directly.

Overall, stakeholders do not consider FP7-related communications to be a major problem, and especially not the programme objectives. However, it may yet be a limiting factor as the Cooperation Programme attempts to reach into emerging sectors and address itself to dynamic, younger businesses in the new economy.

3.2 Effectiveness

Effectiveness concerns the extent to which objectives set for programme components are indeed achieved.

The evaluation questions in this area are:

Q4. What are SMEs' roles in the projects? Are there differences between the different thematic programmes?

Q5. What are the outputs of the initiative?

Q6. To what extent has the initiative's output contributed to achieving its specific objectives and general objectives?

Findings on effectiveness of the Cooperation Programme

1. Overall, the eCORDA database shows that in 11% of all Cooperation projects SMEs have the role of project coordinator; however the percentage of SMEs in the interviews that report to have taken the initiative is higher (18%). Of all SME participations just over 5% are in the role of coordinator. Over 70% of SMEs are active in the core research activities (R&D). However looking into mere detail in the cases studies, it was revealed that it also happens that SMEs are invited to participate and to take a specific role, just to qualify for the criteria set by the programme. The SME is for example contacted by a research provider who took the initiative to start the application and might remain in the driver's seat in practice.
2. In the period 2007-February 2013, in total 5 650 projects in the Cooperation Programme have started. In these projects there are 11 952 SME participations (not unique SMEs[57]) which is 18.5% of all participations. Most SMEs (73%) participate only once in the Cooperation Programme; almost a quarter (24%) participates 2 to 5 times.
3. The specific target that at least 15% of the budget should go to SMEs has been achieved: 16.3% goes to SMEs.
4. The Cooperation Programme is delivering outputs that are relevant to the research and innovation ambitions of participating SMEs, and in this sense it is an effective programme. No stakeholder interviewed argued that the programme is not effective.
5. It is however difficult to determine more precisely the extent to which the programme outputs have been achieved with regard to the participation of SMEs. Firstly the general objectives of the Cooperation Programme do not explicitly refer to SMEs. Moreover, the objectives are not formulated in a SMART way, e.g. not being Specific, Measurable, Attainable, Relevant and Time-related.
6. That SMEs are rather positive about the effects of the programme can also be derived from the fact that more than a quarter of all SME participants in the programme, participate in more than one Cooperation project in FP7. In a more general sense, the SME interviews show satisfaction with the effects of the Framework Programmes in general: participants have substantial experience with the Framework Programmes FP 4-7, only 30% have no previous experience.
7. Given the previous item - many participants doing more projects - it is important to also pay sufficient attention to provide access to newcomers in communication, setting conditions etc.
8. In general, the SMEs in the interviews report that the effects most commonly realised are those related to the creation of knowledge, cooperation aspects and the actual commercialisation of either the project results or through advancing an existing product/service using the research results.
9. In general, intangible outcomes for SMEs are on average higher than tangible outcomes, which can be expected due to the interim nature of the evaluation with projects only recently finished and hence a bit early to already have market effects. Thereby the effects most commonly realised within participating SMEs are those related to the acquisition of technical knowledge; learning effects, how R&D projects should be managed; relations with new partners, networking and experience on an international level. These intangible outcomes are important as they are instrumental in reaching tangible outcomes.

[57] Because one SME may participate in more than one project, this refers to the number of participations rather than to unique SMEs.

3.2.1 Total number of projects and SME participation

In total 5 650 projects in the Cooperation Programme were started

The eCORDA database shows that in the period 2007-February 2013 in total 5 650 projects in the Cooperation Programme were started with a total EC contribution of € 20 600 million. The distribution of these 5 650 projects by start year and end year is shown in Table 3.1[58]. For example, in 2009 in total 837 projects were started, of which 2 projects were already finished in 2009, 31 finished in 2010, 142 finished in 2011, 382 finished in 2012 and 233 are supposed to be finished in 2013, 46 in 2014, and finally 1 project is foreseen to be ended in 2015.

The majority of the projects started in the period 2008-2012 and consequently most of the projects are (expected to be) finished in the period 2011-2015.

Table 3.1 Frequency of projects in the Cooperation Programme: project start year by project end year, 2007-February 2013

Project start year	Project end year											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
2007	5	7	15	7	2	1	0	0	0	0	0	37
2008	8	49	245	508	315	84	4	1	0	0	0	1 214
2009	0	2	31	142	382	233	46	1	0	0	0	837
2010	0	0	6	47	225	570	211	41	1	0	0	1 101
2011	0	0	0	2	35	195	540	224	57	1	0	1 054
2012	0	0	0	0	1	25	193	600	224	57	5	1 105
2013	0	0	0	0	0	0	30	96	111	55	10	302
Total	13	58	297	706	960	1 108	1 024	963	393	113	15	5 650

Source: Panteia 2013, based on eCORDA March 2013.

In total 18.5% of the (not unique) participants are SMEs

Among the total number of 64 508 participations there are 11 952 SME participations (not unique SMEs[59]) in the Cooperation Programme, meaning that in total 18.5% of the participations is by SMEs.[60]

Figure 3.3 shows the development of the SME participation over time, according to the starting year of the projects. During the period 2007-2011 the share of SMEs in the number of participants was between 16-18%. In 2012 this share made a considerable step towards 25%; in other words in 2012 amongst each four participants one SME was involved. In the short period of 2013 that is considered (measured in March 2013), the SME-share in the number of participants was somewhat higher than before 2012.

The strong increase in the share of SME participation from 2011 to 2012 may be the result of some SME-friendly measures in the calls of the 2011 and 2012 work programmes to encourage SMEs to participate, such as ring-fenced budgets for SMEs or topics highly relevant for SMEs.[61]

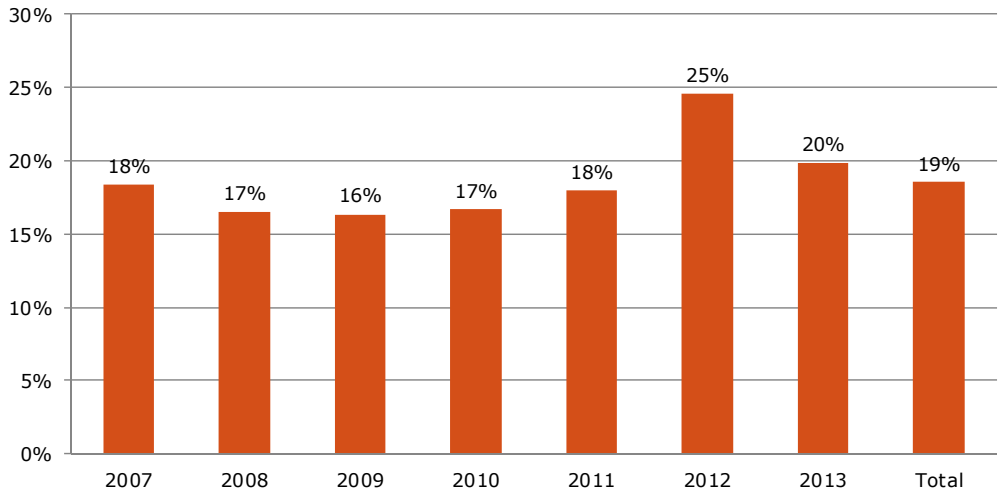
[58] This table is taken from Annex 1, Volume II that presents an overview of the results obtained from the quantitative analysis.

[59] Because one SME may participate in more than one project, this refers to the number of participations rather than to unique SMEs.

[60] Information on the overall population of participants in FP7 is based on the eCORDA set of DG RTD, version March 2013. Some additional data on participants and control group have been obtained from the ORBIS dataset of Bureau Van Dijk. See Annex 1, Volume II for more details.

[61] See: European Commission (2012), DG Research & Innovation, Facts and Figures. The proportion of Cooperation programme funding going to SMEs continues to rise, SME Update Issue 14, 26 October 2012, Brussels; and European Commission (2012), DG Research & Innovation, SME Participation in FP7. Report Autumn 2012, Brussels.

Figure 3.3 Cooperation Programme: share of SME-participants by starting year of the projects, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

As already mentioned in Section 2.2, the measures aimed to create an environment that enables more SMEs to take part in FP7 projects. In the work programme 2011 some 50 specific research topics were presented in order to increase the participation of SMEs, and in the work programme 2012 there were more than 90 research topics that specifically addressed SMEs. The implemented strengthening measures were of various types, such as calls with broad and/or SME-friendly topics, streamlined application processes, making modest-sized consortia more eligible for funding, placing greater stress on close-to-market or demonstration activities, and the inclusion of specific criteria in calls, such as explicitly stipulating SME participation or SME coordination in projects, and output for the benefit of the participating SMEs. In addition, ring-fenced budgets for SMEs allocated a minimum share of the budget to participating SMEs.

All these measures seem to have managed to increase the participation of SMEs in FP7 projects. A typical example of a call that was launched to trigger more SME participation was the 'FP7-Health-2012-Innovation-2' call. The particular strengthening measures implemented varied from one theme to another.

More than one quarter of the SMEs participate in more Cooperation projects

Table 3.2 presents the frequency of the number of participations per participant for all participants and for SME-participants in particular. It shows that most participants participated only once in the Cooperation Programme during the period 2007-February 2013. Amongst the SMEs 73% participate only once in the Cooperation Programme. In other words, more than a quarter (27%) participate in more Cooperation-projects. Amongst the SME-participants the three most frequent users of the Cooperation Programme participate between 26-50 times, with the most frequent user participating 43 times.[62]

[62] Especially with the group of RTOs there are some organisations that are participating in a lot of projects simultaneously. The top performer participates in 713 projects in the Cooperation Programme only. But there is also an organisation classified as SME that participates 43 times in the Cooperation Programme.

Table 3.2 Frequency of numbers of participations per participant, amongst all participants and amongst SME-participants, in the Cooperation Programme, 2007-February 2013, in numbers and percentages

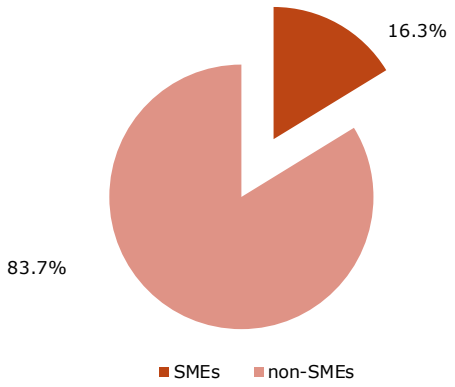
Number of participations	All participants		SME-participants	
	number	%	number	%
1 time	11 196	63.5%	5 272	73.1%
2 to 5 times	4 701	26.7%	1 693	23.5%
6 to 10 times	803	4.6%	188	2.6%
11 to 25 times	565	3.2%	52	0.7%
26 to 50 times	199	1.1%	3	0.04%
51 to 100 times	102	0.6%		
101 to 200 times	46	0.3%		
201 to 300 times	13	0.1%		
More than 300 times	4	0.02%		
	Max. = 713 times (see footnote)		Max. = 43 times (see footnote)	

Source: Panteia 2013 based on eCORDA March 2013.

The aim that 15% of the funds goes to SMEs is reached

Figure 3.4 reveals that in total 16.3% of the total funds for Cooperation went to SMEs during the period 2007-2013, measured in March 2013. Thus the aim that at least 15% of the funding available for the Cooperation Programme goes to SMEs is reached. That SMEs constitute 18.5% of all participations and receive 16.3% of all funding of the Cooperation Programme implies that SMEs receive on average only a slightly lower budget from Cooperation than other types of participants.

Figure 3.4 Shares of the Cooperation Programme funds going to SMEs and non-SMEs, 2007-February 2013, in percentages

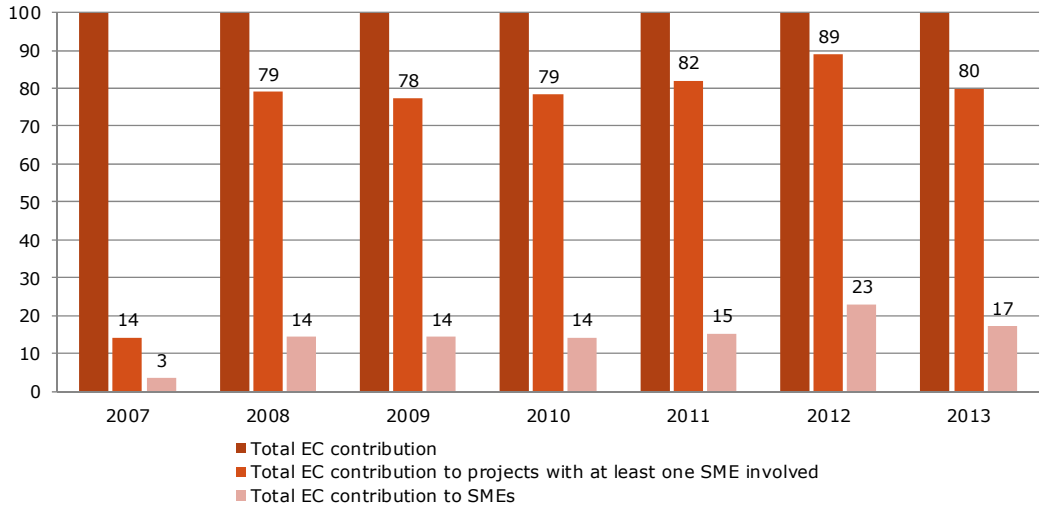


Source: Panteia 2013, based on eCORDA March 2013.

Budget share going to SMEs is increasing over time

Per starting year there are slight differences as shown in Figure 3.5. Firstly, it shows that usually each year about 80% of the total EC funds go to projects in which one or more SMEs are involved. Secondly, it reveals that in projects starting in the years 2008-2010 the aim of 15% of the total financial resources going to SMEs has not been reached yet, but that in later years 2011-2013 this aim has been reached: in projects starting in 2012 even 23% of the total allocations goes to SMEs.

Figure 3.5 Cooperation Programme: share of EC contribution to SME-participants by starting year of the projects, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

Overall the success rate for EU applications is 20%

Unfortunately only the size class of participants is included in the eCORDA dataset, not the size class of applicants. Hence a success rate for SME applicants cannot be calculated on the basis of the eCORDA dataset. Overall the success rate for applications of the Cooperation Programme is 20%: in total 328 409 entities participated in proposals (some more than one time), of which 64 508 resulted in a participation in an approved project.

The success rate for applicants varies from 10% and 36% between the thematic priorities. The success rate is highest in Space: more than one third of the applicants got their project approved. In the quite new thematic priority Socio-economic Sciences and Humanities thus far only one out of ten applicants got their proposal granted.[63]

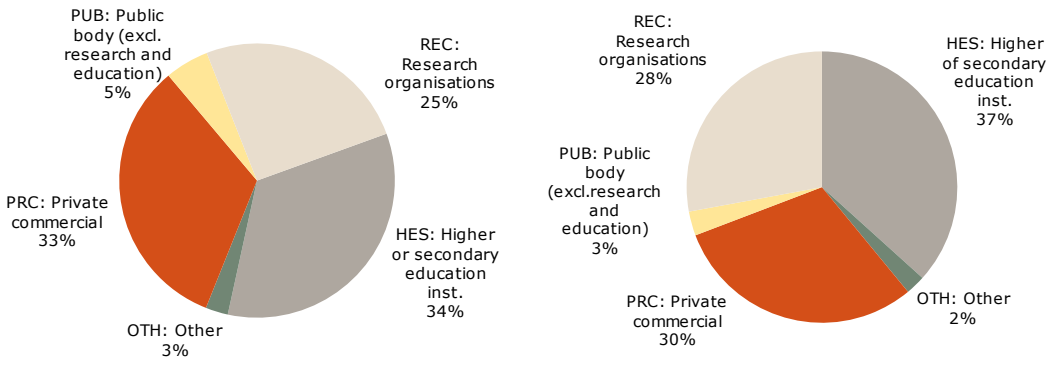
3.2.2 Characteristics of participants

Of all participations about one third are private commercial organisations and one third higher educational institutions

eCORDA data shows that of all participations about one third are private commercial organisations and one third higher educational institutions. The third major group is RTOs, some 25%. The distribution of budgets is in line with this, implying that the average amount allocated to participants from the various groups does not differ a lot. See the two pie charts in Figure 3.6.

[63] In Annex 1 of Volume II more details on success rates are provided, i.e. by thematic priority (Figure 2.7), by NACE sector (Figure 2.8) and by country group (Figure 2.9).

Figure 3.6 Distribution of number of participants (left) and financial budget (right) in the Cooperation Programme, by type of participant, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

Characteristics of SME-participants regarding R&D and innovation as emerging from the SME interviews

Only 9% of SMEs interviewed were not involved in any R&D activities at all before their participation in the Cooperation project in question. Almost all of those (90% percentage points) that were involved in R&D activities before regularly conduct Research, Development, Technology and Innovation (RDTI) activities such as R&D projects.[64] This is also reflected by the fact that 88% stated that the company's business strategy explicitly included elements of innovation and 90% have employees whose tasks include research and innovation activities. However, elements reflecting "hard facts" beyond general involvement in RDTI activities score significantly lower values, i.e. only 38% of the SMEs have an explicit innovation strategy, 42% have a dedicated R&D department and 45% have an annual budget for RDTI activities. These results seem to show that - while RDTI activities are nothing new to almost all Cooperation participants - only half (or less) of them could be considered as having really integrated such activities into their organisational structure and behaviour.

While 70% of the respondents conduct internal RDTI projects with own funds or additional private external funds, contract research is clearly less relevant (34%). About 18% of the SMEs interviewed do not conduct RDTI activities outside publicly funded projects.
Apart from the project in question, most participants in the Cooperation Programme have substantial experience with the Framework Programmes (30% do not), especially with FP 4-6 but also with FP7. While other European funding programmes are less relevant (31% were participating in other support programmes, with the most used programmes being CIP, Eureka, Eurostars, Structural Funds and Interreg), national/regional funding is being utilised by three quarters of all SMEs interviewed.

3.2.3 Role of SMEs within Cooperation projects

One out of 10 projects is coordinated by an SME

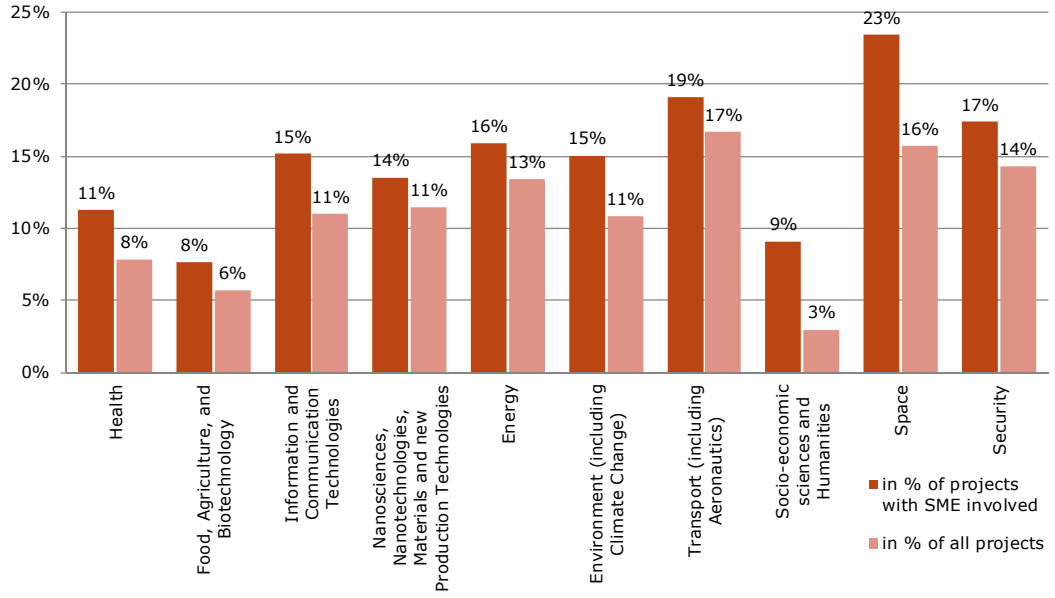
In 74% of the Cooperation projects one or more SMEs are involved (source eCORDA). In 15% of these projects the coordinator is an SME. Related to the total number of Cooperation projects, the coordinator is an SME in 11% of the projects.
Looking at the share of SME participants that is done in the role of coordinator the percentage is just above 5% (of 11 342 participations, 610 coordinator positions).

[64] In the interviews, SMEs with more than one participation are somewhat overrepresented.

The extent to which an SME is coordinator of a Cooperation project differs for the ten thematic priorities: see Figure 3.7. Roughly, three groups can be distinguished:

- Three thematic priorities with relatively less involvement of SMEs in the role of project coordinator: (1) Health, (2) Food, Agriculture and Biotechnology, and (3) Socio-economic sciences and Humanities.
- Four thematic priorities with a relatively middle participation of SMEs in the role of coordinator in the projects: (1) Information and Communication Technologies, (2) Nanosciences, Nanotechnologies, Materials and new Production Technologies, (3) Energy, and (4) Environment (including Climate Change).
- Three thematic priorities in which an SME is relatively often the coordinator of the Cooperation project: (1) Transport (including Aeronautics), (2) Space, and (3) Security.

Figure 3.7 Share of Cooperation projects in which an SME is coordinator, by thematic priority, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

The majority of SMEs were involved in a project that was already developed

The SME interviews also provide additional information on the role of SMEs. Not only who is registered as coordinator (8% of SMEs interviewed) and what type of activities they carried out once the project had started, but also who took the initiative to start the project:

- 18% SMEs interviewed in the Cooperation Programme took the initiative themselves;
- 24% reported it to be a joint decision to develop the project;
- 55% of the SMEs stated that another organisation took the initiative.[65]

Therefore, the majority of the SMEs were invited to participate in projects already being developed. This result reflects the fact that SMEs are more often an addition to a project than the initiator, which for Cooperation with its stronger orientation towards research (as compared to applications) was somewhat expected.

[65] For a few percent of the respondents no answer is available.

The overall picture[66] differs only slightly when looking at the thematic priorities with the exception of:

- space, where the share of SMEs deciding themselves to initiate the project is much higher;
- security, where none of the SMEs initiated the project;
- socio-economic, energy, ICT with relatively large shares of joint initiatives.

SMEs are more often involved in the set-up of the project in case less national funding is available

When looking at country groups defined by gross domestic expenditure on R&D (GovERD per inhabitant) the results of the SME interviews indicate that the lower the availability of national public funding the higher the share of SMEs that either initiated the project or were included in joint decisions.
Looking at the activities undertaken by SMEs in the projects, they are most active in the core research activities: research (71%) and technology development (56%)[67], which reflects the target group of research-intensive enterprises capable of doing "their own" research.

Within projects the majority of SMEs provided the technical base and contributed to the determination of research and market need

The role of SMEs interviewed vis-à-vis the technology developed in the project predominantly includes providing the technology basis (e.g. platform technology) (57%) and contributing to the definition of the underlying research and market need. To some extent the latter moderates the aforementioned result of SMEs being less involved in the set-up of a project. A significant share (41%) of SMEs was in the project as a technology integrator while only 27% were actual (end-) users. This result also meets the expectation as the target group includes research-intensive, technology developing SMEs. When looking at combinations of roles: In the Cooperation Programme the technology users are those with the weakest links to other roles (i.e. there are more SMEs that claimed only this role for themselves than any other category) and also not the "core" beneficiaries according to the programme rationale and intervention logic. Technology/end-users in Cooperation projects are predominantly in the projects to safeguard the market orientation.

Four types of roles can be distinguished on the basis of case studies

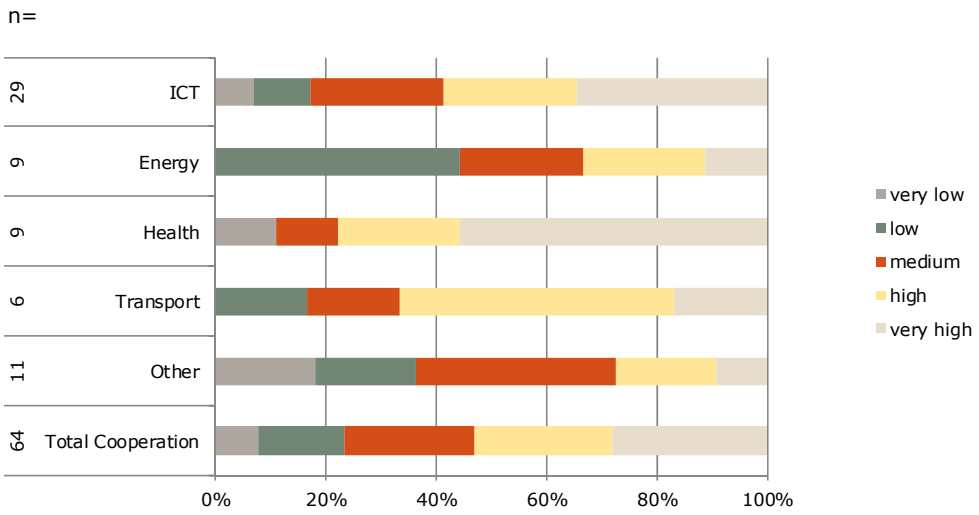
The selected case studies very rarely have SMEs in the role of the official coordinator of a project: In 5 out of 67 Cooperation projects SMEs are coordinator. It should be noted that this finding is to a small extent due to one of the selection criteria for case studies, as an effort was made to exclude SMEs that are purely engaged to provide project management services, with no particular ambition in research and innovation for their own business.
In the case studies, case study authors assessed the extent to which the objectives of the project and the SME's objectives matched and the extent to which the SME was involved in the design of the project. The results are shown in Figure 3.8.

Figure 3.8 shows that in more than half of the case studies, the SME is highly involved in the design of the project. In health, where in 3 out of 9 case studies the observed SME was also coordinator of the project, involvement in design is particularly high.

[66] Due to a relatively small number of observations, this should be considered as an indication only.
[67] For more details see Figure 14 in Annex 3 in Volume II of this report.

Not surprisingly, for coordinators the involvement is indeed very high. Interestingly however, case study research underlines that there are various other ways SMEs can play a central role in the project.

Figure 3.8 Assessment of the SMEs involvement in project design by case study authors



Source: Technopolis Group 2013, analysis of 64 case studies in the Cooperation Programme.

The following roles for SMEs were distinguished in the case studies:

1. SMEs in the role of project coordinator. Projects that are coordinated by SMEs are rare, but they have a high probability to show "good practice" in terms of the impact of the project on SMEs performance. Case studies show that SMEs in the role of the initiator and coordinator have a clear vision of what they want and need for their research and innovation agenda, and they know that FP7 provides opportunities to get this. They actually take the driver's seat.
2. SMEs in leading position with strong influence on project design. It should be noted that there are also cases where SMEs initiate the project and maintain a leading position, but decide not to take over the official project coordination but are very active in project design and in communication with project partners. They present themselves like project owners and have a comparably clear vision of their needs and opportunities. However, they are not the primary contact with Commission services. In general, they don't mention this as a problem.[68]
3. SMEs with a key role in the project, but without overall leadership. The third category concerns SMEs that have been invited to participate, for some particular need within the project. This might concern overall integration or contributions to particular work packages. Frequently, the SME is for example contacted by a research provider to test and integrate the results in their business.
4. SMEs that participate only marginally. One of the selection criteria for case-studies in the Cooperation Programme and the Research for SMEs scheme was, that the SME receives at least 90 000 EUR. Therefore, very low participation intensity has been excluded, in order to increase the chance to learn about different ways that lead to positive impacts of SME participation. As a consequence, within case studies covering the Cooperation Programme, there are no SMEs that are totally at the margin of the project. Still, both project coordinators and participants regularly refer to partner SMEs that are less involved than others.

[68] See Text box 9 in Annex 5 of Volume II for illustrations.

Firstly, Section 3.2.3 shows that in relatively many of the SME interviews the SME coordinating the project was approached for an interview (eCORDA data indicates 5% of SME participations are done as coordinator, in the SME interviews 8% of the respondents were coordinator). The information was gathered from the SME interviews and the case studies complemented the information on the role of the SMEs as emerged from eCORDA data in various ways:

- *It showed that the formal position within the project, i.e. being the coordinator or one of the participants is not the entire story. In the actual conditions SMEs might have a stronger or weaker role than their formal position suggest.*
- *The interviews and case studies showed much more aspects of the role of the SMEs within the projects, e.g. involvement in taking the initiative for the project, role in the research carried out (e.g. providing the technology basis or being an end-user of the technology being developed).*

3.2.4 Different types of outputs of the projects

According to stakeholders the output contributes to the objectives of the programme

According to stakeholders, the Cooperation Programme is delivering the kinds of outputs of relevance to the research and innovation ambitions of participating SMEs, and in this rather narrow sense it is an effective programme.

Published FP7 monitoring data include metrics for publications (in addition to contract reports) and for different kinds of Intellectual Property Rights (IPR). They also include data on "foregrounds" and the employment of scientific staff. Unfortunately, the published statistics do not distinguish between SMEs and other types of programme participants and so are of limited value for this Interim Evaluation.

It is also difficult to determine the extent to which the programme outputs have contributed to achieving the general objectives of the Cooperation Programme, from the perspective of Europe's SMEs, as it has no general objectives that relate to small businesses. Moreover, the SME-related objectives it does specify are typically associated with a single call for proposals and written in a form that is directional rather than SMART. They do not provide the kind of data one might wish for in order to judge the sufficiency of a call's achievements or the portfolio's overall effectiveness.

The stakeholder interviews are reassuring; at least inasmuch as no one interviewed argued that the programme is not effective. The great majority of contributors stated that they believe the Cooperation Programme is making a positive difference to SME participants' innovation ambitions and commercial performance and that it is in those limited terms, effective. Contributors did however signal a note of caution, acknowledging they have no good view of programme outputs overall, beyond the occasional project or the short stories set out in the directories of successful projects.[69,70]

The FP7 monitoring data include statistics on the numbers of reported 'foregrounds'. This is the name used by the Commission to refer to selected types of tangible and intangible project results that occur within the life of a FP7 project and can therefore be recorded in the final contract report and programme monitoring system. This

[69] The individual project directories typically comprise a few tens of success stories and are mostly descriptive. Their primary purpose is helping prospective applicants to recognise the potential benefits, and as such they are rather generous in their presentation of benefits, giving no real sense of the reach or significance of the achievements or their additionality.

[70] See also Locchi (2008).

includes information and knowledge, whether or not it can be protected, which is generated within the project. Such results include rights related to copyright, design rights, patent rights, plant variety rights, and similar forms of protection.
Table 3.3 presents an overview of the foregrounds reported in all Project Final Reports (to May 2013) based on the published data set out in Table 39 of the 6th FP7 Monitoring Report. These data relate to the FP7 priority areas, rather than SMEs specifically, and so need to be treated with some care.

Table 3.3 Foregrounds reported in the FP7 Cooperation projects by thematic areas

Thematic area	Reported foregrounds	Commercial exploitation	General advancement of knowledge	Exploitation via standards	Exploitation through social innovation	Exploitation through EU policies
Health	171	42	106	1	15	7
Food+	5	1	0	1	3	0
NMP	152	75	64	6	2	5
Energy	69	16	51	0	0	2
Environment	77	2	30	2	8	35
Transport	49	12	19	0	2	16
SSH	25	3	3	0	6	13
Space	1	0	0	0	0	1
Security	17	9	1	0	5	2
General	3	0	0	0	0	3
Total Cooperation Programme	569	160	274	10	41	84
Total CP (%)	100%	28%	48%	2%	7%	15%

Source: Technopolis Group 2013, computation of data extracted from Table 39 of the 6th FP7 Monitoring Report, European Commission, DG RTD, August 2013.

The table shows that the Cooperation Programme produced 569 foregrounds recorded in 731 Final Reports, hence 0.8 foregrounds per project, while the RSME scheme produced 4 foregrounds per project.

The table also shows the distribution across the five types of foregrounds:
- commercial exploitation of R&D results;
- general advancement of knowledge;
- exploitation of R&D results via standards;
- exploitation of R&D results through social innovation;
- exploitation of R&D results through EU policies.

The statistics show that the Cooperation Programme is delivering proportionately more general advances in knowledge as compared with other impact pathways. The exploitation (use) of outputs via technical standards is rather uncommon in the Cooperation Programme. Exploitation (use) through EU policies is on the other hand quite widespread for the Cooperation Programme.

Most common and significant output according to the SME interviewed is creation of knowledge, cooperation aspects and the actual commercialisation of project results (directly or through improving of existing products services)

There is one overall trend to be observed in the SME interviews: in general, the effects that are not only most commonly realised but that are also considered to be most economically significant are those related to the creation of knowledge, cooperation aspects and the actual commercialisation of either the project results or through advancing an existing product/service using the research results.

Many knowledge related effects[71]

More than 90% of the SMEs interviewed stated that they managed to gain new knowledge and/or know-how with 64% of the interviewees stating a very high or high overall economic significance of these effects for the company. While only 7% apparently did not manage to gain new knowledge, it is nevertheless surprising as gaining new knowledge is usually considered a more basic effect, especially in projects under the Cooperation Programme. The picture is a bit different when looking at the effect *'finding a solution for a significant, concrete technological challenge'*: almost 31% did not manage to realise this effect at all, possibly due to their role in the project (e.g. fulfilling rather limited tasks or contributing to other organisation's challenges in a research field not at the core of the innovation and business strategy of the SME in question).

The apparent low references to IPR as the most visible (by-)product of knowledge creation - 62% stated that they did not create IPR and only 16% of all SMEs interviewed or 42% of those that managed to create IPR assign (very) high economic significance to this - is certainly rooted in the multiform challenges of especially SMEs when it comes to protecting their knowledge. Possible explanations are that IPR have a diverging relevance in different research fields and/or IPR are not granted (yet) and/or IPR will only gain economic significance once the technology or product they are related to starts to sell, which refers to the economic effects that are still somewhat low at this stage.

Majority of SMEs interviewed report some exploitation of results[72]

When it comes to the commercial transformation or commercialisation of research results, it is apparent that a majority of the SMEs interviewed managed to realise effects in this area. 81% claimed to have advanced their products etc. using the projects results (but only 47% assign very high or high economic significance to this) and 71% managed to implement an innovation based on the project[73] and 39% assign very high or high economic significance to these innovations. While both results clearly show the overall impact of Cooperation projects in this regard, it is nevertheless interesting to note that the difference could refer to SMEs benefitting rather in terms of advancing existing technologies than successfully getting engaged in new and emerging technologies. What adds to the former results is the notion that 47% of the SMEs also managed to shorten the time-to-market using the research results but again the share of enterprises assigning very high or high significance to it is considerably smaller with only 15%. An explaining factor of the medium to low economic significance is that (sometimes even very) limited time passed between the project end and the interview. Thus, in many cases exploitation could not be fully achieved yet.

Cooperation and networking increased a lot[74]

The SMEs' networking and collaboration opportunities in innovation activities benefitted from participation in the Cooperation Programme immensely. About 81% of SMEs interviewed established new strategic (i.e. beyond ad-hoc, project-based cooperation) relationships with partners abroad (and 45% of the respondents assigned very high or high economic significance to these partnerships). 57 % managed to launch follow-up projects with their (newly found) partners (34% with high or very high economic significance) and 61% claimed to have gained access to research networks they did not have before.

[71] See Section 6.3 Knowledge-related effects in Annex 3 of Volume II.
[72] See Section 6.4 Exploitation, commercialisation in Annex 3 of Volume II.
[73] This does not imply that products and innovations have already been marketed.
[74] See Section 6.5 Networking, collaboration effects in Annex 3 of Volume II.

Capacity improved because of participation[75]

Some 78% of the respondents in the Cooperation Programme find their participation improved their ability to utilise external know-how and research infrastructure. However only one third assigned a (very) high economic significance to this.

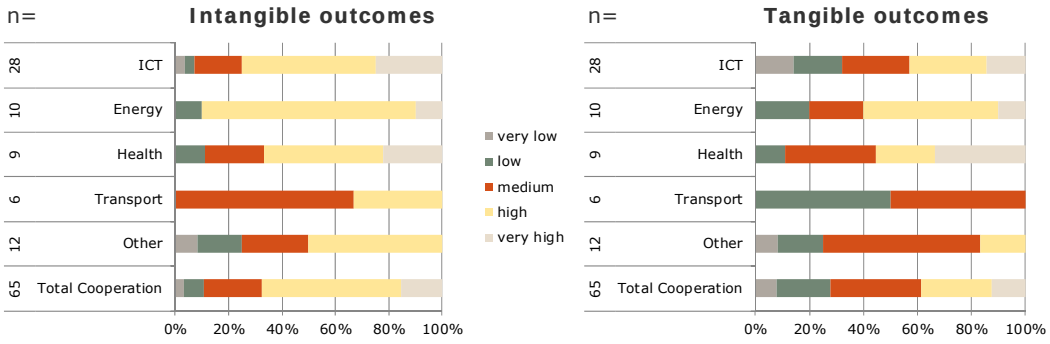
Furthermore, the capacity to successfully complete innovation projects and the annual expenditures on research and innovation increased according to a majority of the respondents (68% and 57% respectively). However the share of SMEs that assigns a high or very high economic significance to this is rather low (27% and 25% respectively).

Slightly more than half of the interviewees confirm a positive effect of their FP Cooperation participation on their ability to attract private funds and/or an increase of their number of permanent staff with research and innovation task (53% and 50%). The percentage assigning a high or very high economic significance is 20%and 16%, respectively.

Insights on tangible and intangible outcomes emerging from case studies

As has been already shown by interviews, intangible effects notably related to knowledge and networking are broadly observed within SMEs participating in the FP7 Cooperation Programme. As shown in Figure 3.9 the assessment of case study authors provides a clear picture indicating that intangible outcomes for SMEs are on average higher than tangible outcomes. Figure 1.3 in Chapter 1 already showed an overview of R&D-investments and their effects in different moment in times with things like collaboration in phase 1 (short-term) and business opportunities in phase 2 (mid-term). But intangible outcomes like increased knowledge, networking and international contacts are important as they are instrumental in reaching tangible outcomes later on.

Figure 3.9 Assessment of tangible and intangible outcomes for SMEs of projects under the Cooperation Programme by case study authors



Source: Technopolis Group 2013, analysis of 65 case studies in the Cooperation Programme.

Again, the thematic priority Health is an exception, where tangible outcomes score relatively high and both type of outcomes coincide. Energy projects covered by case studies also have a good score with regard to tangible outcomes.

[75] See Section 6.6 Capacity-related effects in Annex 3 of Volume II.

Intangible outcomes[76] are in order of importance:
- mainly acquisition of technical knowledge;
- further learning effects, for example on how such projects work and are to be managed;
- relations with new partners, networking and experience on an international level.

There are also various tangible outputs, mostly demonstrators, prototypes, tools etc. As has been shown in Figure 3.9, and by the SME interviews, these are less pronounced than intangibles, and most of the time still far from commercialisation, which again is at least to some extent explained by the limited time the SMEs spent on the commercialisation of their projects (recent closure of project).[77]

With regard the extent to which the projects contributed to achieving the specific and general objectives of the Cooperation Programme, the comparably high performance of cases in the domain of Health shows that a considerable number of SMEs are open to adapt their orientation to specific societal needs, like better understanding and treatment of influenza. Still, project outcomes especially in this domain are yet too far away from market implementation, to allow assessing the extent to which final objectives have been achieved on the basis of these case studies.

This Section 3.2.4 has shown with regard to outputs that SMEs obtained until now from their participation in the Cooperation projects that results from SME interviews and case studies are very much in line with each other.

3.3 Efficiency

Efficiency concerns the question to which extent the desired effects are achieved at reasonable cost.
The evaluation questions in this area are:
Q7. How economically have the initiative's inputs been converted into outputs (input-output ratio)?
Q8. Have the expected outputs been clearly formulated?

Findings on efficiency of the Cooperation Programme
1. Effects of the Cooperation Programme identified are relatively often intangible ones, partly because serious economic effects are most like to be measurable only several years after completion of the project, hence not within an interim evaluation (See also Figure 1.3 in Chapter 1).
2. For 64% of the participating SMEs are of the opinion that the benefits of their Cooperation Projects already outweighed the costs and another 27% expect this to be realised in future Only 8% do not see this happening at all.
3. Of the various implementation aspects studies, '*time to payment*' is the most satisfactory in the perception of SMEs with a score of 20% very satisfactory and 38% satisfactory, a total of 58%. However this implies that 42% are not really satisfied and this is relatively important for SMEs that often face difficulties in pre-financing R&D activities.
4. There is a generally positive view on the Cooperation Programme's efficiency as regards the nature and extent of the SME-related outputs being produced. However, this is based on a more qualitative understanding of projects producing numerous additional relationships, advances in understanding etc.
5. In the perception of participating SMEs efficiency of the programme might still be improved. Where more than half of participating SMEs find several implementation aspects as time-to-payment, role of the scientific officer, quality of documents and guidelines satisfactory; only one third of all participating SMEs find the administrative requirements for applications satisfactory.

[76] Text box 15 in Annex 5, Volume II illustrates that these intangible outcomes are most relevant for the participating SMEs.
[77] One of the citations in Text box 14 in Annex 5, Volume II shows that participating SMEs also perceive follow-up projects as tangible outcomes.

The question of efficiency however, also raises the issue of management efficiency in the minds of stakeholders and participants, and the evaluation also explored this aspect of the programme.

Number of patents in comparison to budget spent

FP7 monitoring data include output data on for example publications, IPR and 'foregrounds' as shown in Section 3.2, Table 3.3. This data can be used to estimate efficiency, but unfortunately not for the SME participants as no size class information is available in these sources. The latest monitoring report of August 2013, presents output data based on reports through to 15th May 2013. So, for example, Table 34 of the 6th Monitoring Report shows that 731 completed projects in the Cooperation Programme had reported 386 cases of formal Intellectual Property (IP) of which 318 (82%) are patent applications. Using the average number of patent applications for each completed project (0.4), we can estimate that the total number of 3 637 Cooperation Programme projects may produce around 1 600 patent applications overall. This results in around 1 patent application for every € 12 million of EU contribution. However as mentioned, this data do not distinguish between SMEs and other types of participant, so it is of limited value to this Interim Evaluation.

Commission officials positive about Cooperation Programme's efficiency

From the stakeholder interviews it follows that Commission officials are in general positive about the Cooperation Programme's efficiency as regards the nature and extent of the SME-related outputs being produced. However, this impression is based on a more qualitative understanding of projects producing numerous additional relationships, advances in understanding and (more occasionally) formal Intellectual Property (IP) that would not be produced otherwise, through private endeavour or national programmes. Officials do not have a good quantitative view of outputs and do not keep in mind specific performance ratios.

There was a general sense among wider stakeholders that the Cooperation Programme is a useful programme producing worthwhile benefits for SMEs, which would be greatly reduced or even lost in the absence of the scheme.

Few of the wider stakeholders consulted are in a position to comment on programme efficiency, in an absolute sense, as they have a limited view of the nature and extent of FP7 programme outputs, for SMEs or more generally. Even those respondents that were aware of the Commission's annual monitoring reports did not feel confident in citing the key figures. These stakeholders will typically focus on the programme as a funding opportunity for their constituents or possibly specific projects.

Stakeholders in countries with limited national support are more positive about FP7

A minority of contributors did state that national SME instruments are more efficient, producing similar sorts of outputs more economically. There was however a recognition that this greater efficiency of national measures would almost certainly be lost if they were to be scaled up and turned into transnational schemes. Unsurprisingly, there is widespread and strong support for FP7 among national officials and experts in those Member States where national support for SME innovation is limited or non-existent.

The great majority of stakeholders have more to say about management efficiency and implementation, as compared with output efficiency.

The SME interviews showed that for 64% of the SMEs the benefits of their FP Cooperation participation already outweighed the costs and 27% expect this to be realised in future. Only 8% do not see this happening at all. In sum, participating in a FP7 Cooperation project is an economically worthwhile venture. The assessment varies with the SMEs' roles in the project vis-à-vis the technology as shown in Table 3.4. SMEs that were (also) end-users and SMEs that defined the research/market needs apparently have a slightly more positive perspective on their cost-benefit-relation. In sum, benefits are more likely to outweigh the costs (or at least benefits emerge earlier and thus, show in the assessment already now) for those SMEs that represent the more commercial parts of the innovation/value chain.

Table 3.4 Percentages of SMEs in Cooperation projects for which benefits already outweigh costs by role in project regarding technology

Role of SME in project regarding technology					Total
Definition research/ market need	Provider of technology basis	Provider of technology infrastructure	Integrator	User	
67%	61%	63%	63%	71%	64%

Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

Cooperation Programme management efficiency

The question about programme efficiency invariably raises the issue of management efficiency in the minds of stakeholders and participants, and the stakeholder interviews also explored this operational aspect of the programme.

There is a general view, expressed many times before, that the programme is stronger at the front-end that in its latter stages: the calls for proposals work well and the evaluation process is well regarded. Dissemination activities, by the Commission and project participants, are still the weak link.

These selected impressions reflect the balance of opinion among National Contact Points (NCPs), as shown in the Commission's annual monitoring reports.

SME-specific issues influencing efficiency according to stakeholders

The interviews flagged a number of SME-specific issues within the Cooperation Programme:

- the compatibility of the Cooperation Programme's metabolic rate (time-to-grant, project duration) with that of smaller businesses;
- the role of SMEs within consortia, and the extent to which they are well treated and able to access / use the results beyond the life of the project;
- the vulnerability of projects in the round to the changing circumstances faced by their SME partners, as external events occur frequently and tend to have a more profound impact on a smaller organisation's ability to engage with a transnational project and can all too often create problems for the wider project.

'Time-to-grant'

Table 3.5 presents 'time-to-grant' statistics for the ten Cooperation Programme thematic areas, and for FP7 overall.[78] Time-to-grant (TTG) is defined as the time elapsed from the deadline for a given call for proposals and the signature of the grant agreement. The data include maxima and minima as well as average TTG

[78] The figure is based on statistics for FP7 grant agreements signed in the period 2007 - 2012 (as of May 2013), taken directly from Table 18 (page 42) of the Sixth FP7 Monitoring Report, Monitoring Report 2012, published by the European Commission, Brussels, August 2013.

data, and show that it takes around 11 months on average from proposal submission to contract signature. The averages vary substantially across thematic areas, with ICT performing substantially better than most.

Table 3.5 Time-to-grant for FP7 grant agreements (as of May 2013)

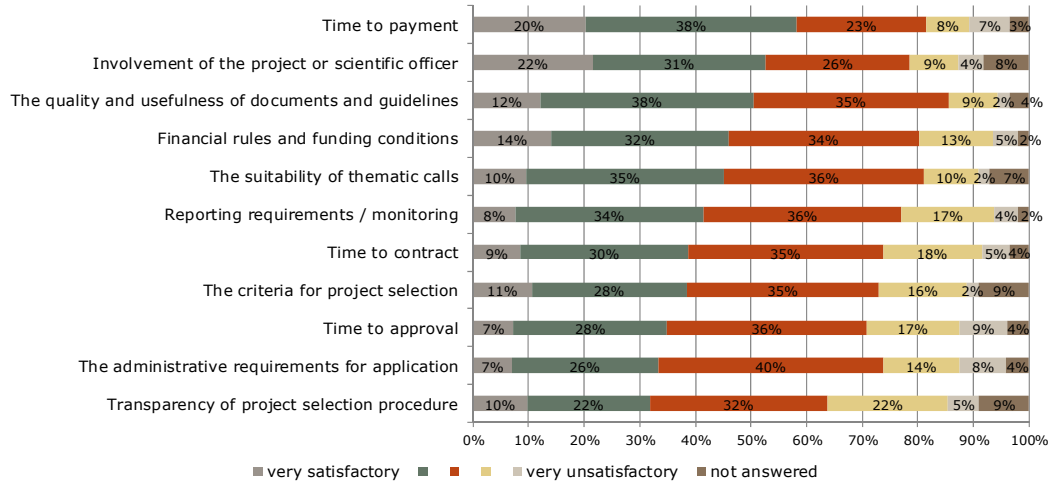
		Time to grant in days		
Area	Number of grants	Average	Min	Max
Health	821	379	142	804
Food+	418	386	226	650
ICT	1 864	257	141	629
NMP	638	355	153	755
Energy	284	333	142	642
Environment	409	397	185	651
Transport	521	423	154	1 115
SSH	199	407	223	748
Space	194	419	314	1 101
Security	196	501	228	914
Overall FP7	18 573	320	13	1 115

Source: Sixth FP7 Monitoring Report, European Commission, DG RTD.

Efficiency in implementation according to SME participants

Also from the SME interviews additional information on the efficiency of the Cooperation Programme has been obtained. The SMEs interviewed expressed their opinion on a range of implementation aspects and in general, this assessment is quite positive. Most satisfactory in the perception of respondents was *'time to payment'* with a score of 20% very satisfactory and 38% satisfactory, hence a total of 58%. However this implies that 42% were not really satisfied and this is relatively important for SMEs that often face difficulties in pre-financing such activities. Least satisfactory in the view of the respondents was '*transparency of the project selection procedure'*, only 10% very satisfactory and 22% satisfactory, total 32%. Still this is higher than the scores for (very) unsatisfactory that is 27%. But this item is not directly an indication for efficiency of the programme. See Figure 3.10 that shows the total list of eleven items evaluated, ranked from high to low total score.

Figure 3.10 Assessment of implementation aspects by all SMEs in the Cooperation Programme



Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

In the perception of participating SMEs efficiency of the programme might still be improved as shown by the relatively low score for administrative requirements in application procedure. The experience was very satisfactory for only 7% and satisfactory for another 26%, which equals one third of all SMEs interviewed. However, this is again still higher that the score for (very) unsatisfactory of 22%, because a relatively large part of the respondents take an intermediate position (40%).

Efficiency in implementation according to case studies

Case studies show that SMEs can only rarely quantify the cost-benefit-relation of the project. However the case studies still provide some insight in some aspects of the efficiency of the funding schemes:

- Many SMEs report that networking was one of the most important features of this programme, and that project management was efficient and satisfying. There is no doubt, that personal meetings and exchange are crucial to achieve these benefits. Many SMEs underline the professional project management. Complaints about the efficiency losses linked to (too many) meetings were mentioned only by a small minority.
- Another aspect of efficiency is related to additional efforts needed to lead the project outcomes to commercial success: Where no follow up is possible after the end of the project, benefits tend to be mainly intangible. Projects might then be regarded as rather expensive learning and networking exercises; however the present intangible effects are most likely instrumental in obtaining tangible effects later on. Case studies show that the capacity to use knowledge-related outcomes of the project for further developments not only depends on the overall quality of the project, but also on the SME and the economic context it is operating in.

With regard to efficiency, this Section 3.3 shows that the various sources used mainly provided complimentary findings.

4 Impact of the Cooperation Programme on participating SMEs and society

4.1 Impacts

Impact is a general term used to describe the significant effects of an intervention on its beneficiaries and other affected parties (society). Impacts can be either positive or negative and foreseen or unforeseen. Initial impacts are called results, whilst longer-term impacts are called outcomes.[79]

The evaluation questions in this area are:

Q9. What have the impacts of the initiative been on society and on the participating SMEs?

Q10. How have employment, turnover and profitability (economic effects) of the participating SMEs developed in comparison to the control group?

Findings on impacts of the Cooperation Programme

1. Growth rates for employment and operating revenue calculated for SMEs participating in the Cooperation Programme of FP7 were considerably higher than for SMEs in the control group.
2. Also over a longer period of eight years - analyses made possible by considering FP6 projects - SMEs participating in the Framework Programmes had a considerably higher employment growth than non-participating SMEs in the control group over the same eight years.
3. The long lasting effects reported by the SMEs themselves are: the actual cooperation itself (more networking and deepened relations with research partners or customers, new contacts in relevant fields or business areas etc.), new knowledge linked to the research field investigated or the technology developed, as well as competences and capacities in innovation.
4. SMEs also frequently reported on positive reputational effects as a result of participation in an FP Cooperation project.
5. It is not possible to fully assess the longer term impacts of the Cooperation Programme on the business performance of participating SMEs within the underlying Interim Evaluation. The analyses show that from successful projects results have been delivered (e.g. prototypes), but that full commercialisation of these has not yet been completed and reflected in variables such as employment, turnover or profits.
6. The perception of participating SMEs is that their competitiveness has improved (80% improvement, of which 12 percentage points strong and 33 rather strong. For actual business performance scores are much lower (for profitability, turnover and employment: some 16% report at this moment in time strong or rather strong improvement). An overall estimation of the percentage growth for the 38-54% of SMEs that report growth results in 22-28%.
7. In most cases it is too early to determine the Cooperation Programmes concrete benefits to society due to innovative problem solving, but various challenges are indeed addressed by funded projects.

[79] This terminology is taken from 'Evaluating EU Activities, a practical guide for the Commission services', July 2004 (See Appendix 1 Glossary).Unfortunately the terminology is not really standardised. In evaluation theory, the terms are often applied as: (a) outputs (or results, immediate); (b) outcomes (mid-term) and (c) impacts (long-term).

4.1.1 Quantitative impacts on economic performance indicators

Econometric analyses were used to compare economic performance of treatment with control group

One of the key issues in evaluating impacts of any intervention or programme, such as FP7, is obtaining a credible estimate of the counterfactual: what would have happened to participants if they had not participated. In other words, there is need to construct a control group that has ex-ante the same probability of participating in FP7.Therefore, we needed two comparable groups of SMEs:

- SMEs that have participated in FP7, the treatment group;
- SMEs that did not participate in FP7, the control group.

Both groups had to be compared before FP7 started, preferably in 2006. Then both groups have to be followed in time on several performance indicators. The more similar and comparable the treatment and control group are in terms of various characteristics, the more likely it is that any observed difference on the performance indicators can be assigned to the use of FP7.

Propensity Score Matching was applied to set up the control group of SMEs

The control group of SMEs was constructed using Propensity Score Matching. This method estimates propensity scores on the basis of a set of observed characteristics for both SMEs receiving support from FP7 and non-supported SMEs. In order to ensure comparability the estimated propensity scores of SMEs participating in FP7 and the control group should be very similar. The basic idea of Propensity Score Matching is to select from a large group of non-participating SMEs, SMEs that are 'most similar' to the participants in all relevant pre-treatment characteristics. That being done, differences in outcomes between this well selected and thus adequate control group and the participants group can be attributed to the programme.[80]

Difference-in-Difference method is applied to consider the differences in developments over time

The Difference-in-Difference method is a technique that can be applied to compare the development over time of different groups of SMEs: it compares the SMEs participating in FP7 with the control group on several performance indicators to quantify the impact of FP7. The simplest set up of this method is one where outcomes are observed for two groups for two time periods. One of the groups is exposed to a treatment in the second period but not in the first period. The second group, the control group, is not exposed to the treatment during either period.

Two following two differences are calculated:

- The first difference measures the change in the impact indicator before and after the FP7 programme for both the participant SMEs (treatment group) and non-participant SMEs (control group).
- The second difference measures the difference in the rate of change in the impact indicators between the participant SMEs (treatment group) and the non-participant SMEs (control group).

In other words, when the same numbers of similar SMEs within the treatment and within the control group are observed in each time period, the average gain in the control group of SMEs is subtracted from the average gain of the SMEs in the participants group. The difference can be attributed to the use of FP7. The main assumption of the Difference-in-Difference approach is that the development of the

[80] See Annex 1 of Volume II for more details.

impact indicators - i.e. apart from participation in FP7 - would be the same between participant SMEs and the control group SMEs.

Two datasets are used to set up the treatment and control group

In order to be able to compare SMEs in the treatment group with similar SMEs in the control group individual, company-level data was needed. Therefore two datasets have been matched on company-level: eCORDA from the European Commission and ORBIS from Bureau van Dijk:

- eCORDA (external COmmon Research DAta warehouse) is a database from the European Commission that contains data on applicants/proposals and signed grants/beneficiaries with regard to a specific Framework Programme for Research. On 7 March 2013 the Consortium received the datasets from DG RTD of the European Commission. The datasets include information on FP7 Grant Agreements and Participants and FP7 Concluded calls for proposals and its applicants from 2007 up to 26 February 2013.
- ORBIS contains information on innovation and business performance of the FP7-participants that is not available in eCORDA. ORBIS of Bureau van Dijk, an extensive database on millions of enterprises in Europe and beyond, primarily consisting of financial data, was used to supplement business information on eCORDA. ORBIS provides also business information on enterprises not included in eCORDA that are used for constructing a control group.

Treatment group: unique SMEs in finished projects in 2008-2010

Taking into account the time lag between participation and impacts of FP7, and the latest year available of the performance indicators needed[81], the focus is on the projects that were finished in the period 2008-2010. In order to construct a proper control group we had to look at the situation before FP7 started. So furthermore, only those unique SMEs were selected for which financial performance data for 2006 was available. In total, 507 participating SMEs met these requirements. These 507 SMEs were candidates for the treatment group (this number includes the Cooperation Programme as well as the Research for the benefit of SMEs initiative). However, some financial performance indicators are much better covered in the matched database of eCORDA and ORBIS than others. Because of the missing data the number of SMEs in the final treatment group is smaller. The final size of the treatment group of unique SMEs depends on which combination of indicators is included in the propensity score models.[82]

Several characteristics of SMEs are used to construct the control group

Several characteristics of the SMEs, i.e. country of origin, sector, age, size in terms of employment and property structure are used to match SMEs by applying the Propensity Score Matching method.[83] An SME to be included in the treatment group (participant in FP7) is matched with an SME in the control group that has - based on its characteristics - a similar chance to participate in FP7.

[81] Looking at the whole sample of enterprises included in ORBIS, for about 13% of the matched organisations the latest year of performance data available is 2012, for 72% 2011 performance data is available and for 8% the latest year available is 2010. For the other part (7%) only 2009 data or (much) earlier years are available. Because of the time period needed between the intervention and the performance measurement due to time lags, 7% is not suitable for the impact measurement. For the other part (93%) 2010, 2011 and/or 2012 performance data are available.

[82] See Annex 1 of Volume II for more details.

[83] However, next to these characteristics that are used, the chance to participate and performance might also be affected by other characteristics such as ambition to growth, level of innovation and export. Due to data limitations, these latter variables could not be used in constructing the control group. See Annex 1 of Volume II for more details.

One-to-one nearest neighbour matching

In the Propensity Score Matching in this Interim Evaluation, one-to-one nearest neighbour matching was used, in order to compare the treatment group (SMEs participating in FP7) with the control group.[84] The one-to-one nearest neighbour matching chooses an SME from the candidate control group that is a matching partner for an SME participating in FP7 that is closest in terms of the propensity score. In this Interim Evaluation we consider three economic performance indicators: number of employees (employment), operating revenue (turnover) and profit margin (profitability). To be more precise:

- employment growth;
- growth in operating revenue;
- growth of the profit margin.

For each indicator performance results are measured as changes in growth rates comparing 2006 (the year before the start of FP7) and the most recent year available. The empirical results of the econometric analyses, using Propensity Score Matching (PSM) combined with the Difference-in-Difference method, show that there are statistically significant differences between the growth of employment and operating revenue between the treatment group and the control group in favour of the treatment group, implying that these positive effects might be attributed to the use of FP7.

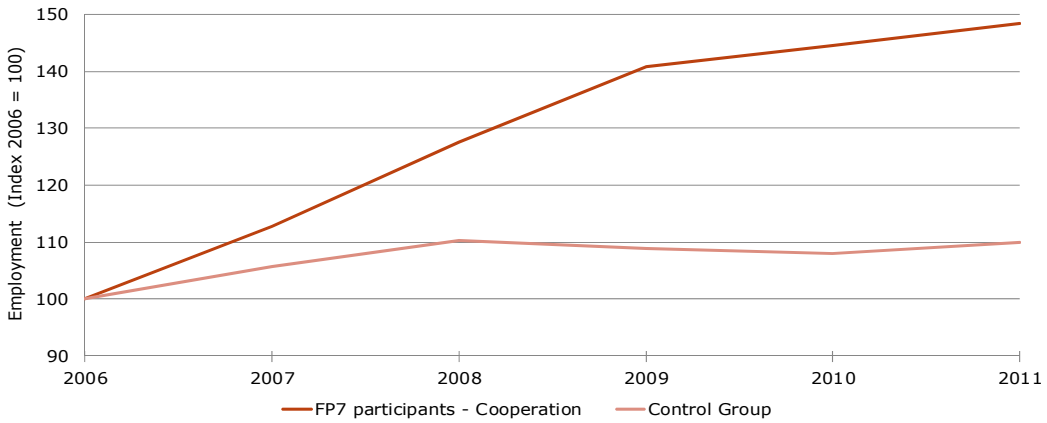
The results on the growth in profit margin present no statistically significant results. This might be explained by the crisis that was apparent in the period considered, and/or because innovative SMEs usually invest their (potential) profits again in new R&D-activities.

The performance differences regarding employment and operating revenue between the treatment and the control group are described in more detail below.

Employment growth rate of SMEs in FP7 higher than growth rate of control group

In Figure 4.1 the index of employment[85] of SMEs participating in the Cooperation Programme is compared to similar non-participating SMEs: the control group has been constructed by applying the Propensity Score Matching method.

Figure 4.1 Index of employment of SMEs participating in the FP7 Cooperation Programme compared to matched non-participants (control group) (Index 2006 = 100)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

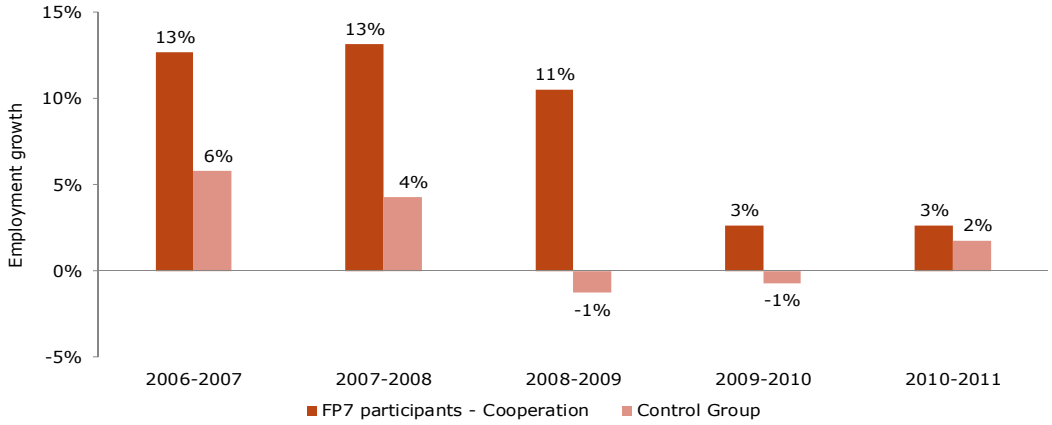
[84] See Annex 1 of Volume II for more details.

[85] Based on 5% trimmed mean. This is the mean if the lower and upper 5% of values are deleted. So, extreme values are excluded both from the treatment and the control group.

The employment of the FP7 participants shows a different growth pattern than the control group. The index of employment is significantly higher for participating SMEs in the Cooperation Programme than for the non-participating SMEs in the control group. In 2011, four years after the start of FP7, SMEs in the Cooperation Programme grew on average 48% in the period 2006-2011. In the same period, for the control group employment increased with 10%.
Hence, the difference between the SME participants in the Cooperation Programme and the SMEs in the control group in employment growth over a four year period is 38 percentage points (48%-10%).[86]

The annual employment growth of SMEs participating in FP7 was higher than the growth rate of the control group in every period investigated (see Figure 4.2). The employment growth rate of SMEs participating in the Cooperation Programme was especially higher in the first few years after the start of the programme. The difference in the annual growth rate between the participants and control group became smaller in later periods.
Between 2006 (before FP7 started) and 2007 (the year FP7 started) SMEs participating in the Cooperation Programme showed an employment growth rate of 13% whereas the control group grew 6% in employment. Four years after the start of the Cooperation Programme in FP7 (the period 2010-2011) the growth rate of participating SMEs was 3% and 2% for the control group.

Figure 4.2 Annual employment growth of SMEs participating in the FP7 Cooperation Programme compared to matched non-participants (control group)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

Period to measure impact FP7 is rather short, also look at impact FP6

As explained in Section 1.5, the time after completion of the projects in FP7 is rather short to seriously look into impacts on the business performance of participating SMEs; therefore a similar analysis on participants in *FP6* was performed in order to get an indication of possible longer term impacts of participation in the Framework Programme. For FP6 the same criteria and methodology were used as for FP7, i.e. participants in FP6 in eCORDA were matched with ORBIS, candidates for the treatment and control group were selected and propensity score matching was used.

[86] However, in Annex 1 of Volume II it is argued that this observed difference might not be (fully) attributed to the participation of SMEs in the Cooperation Programme because of time lags, possibly implying that the SMEs participating in Cooperation Programme are the better performing SMEs regardless the participation in this programme.

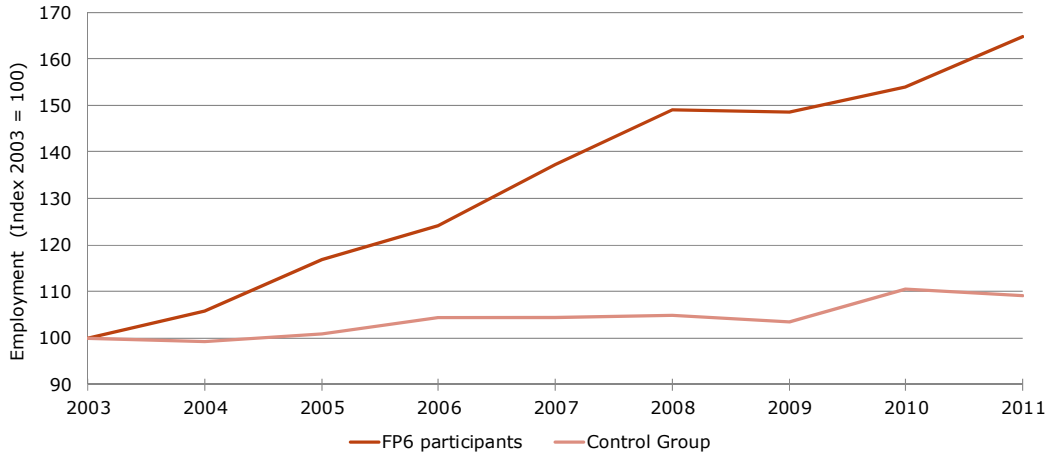
Participating SMEs in FP6 within programmes that are quite similar to the Cooperation Programme and the Research for the benefit of SMEs initiative in FP7 were selected. Only SMEs in those projects were selected that have been finished in the period 2004-2006, to be able to investigate the longer term impacts. More than 90% of the selected SMEs finished their project in 2006.

FP6: higher employment growth rates of participating SMEs than non-participants

The index of employment and annual employment growth rates for the participating SMEs in FP6 priorities that are similar to the FP7 Cooperation Programme are higher than for the non-participating SMEs. However these differences are not significant, because the number of matched SMEs is small.[87]

Only if the FP6 priorities similar to the FP7 Cooperation Programme AND the Research for the benefit of SMEs initiative are analysed together, when applying PSM, the FP6 participants do show significant higher employment growth rates than similar non-participating SMEs in the control group. Although these figures are not for the Cooperation Programme only, they are presented here to provide some indication of the longer term impacts on participating SMEs in the Framework Programme. See Figure 4.3. In the period 2003-2011 SMEs participating in FP6 grew on average 64% in the period 2003-2011. In the same period, for the control group employment grew with 9%.

Figure 4.3 Index of employment of SMEs participating in the FP6 Cooperation Programme AND the Research for the benefit of SMEs initiative compared to matched non-participants (control group) (Index 2003 = 100)

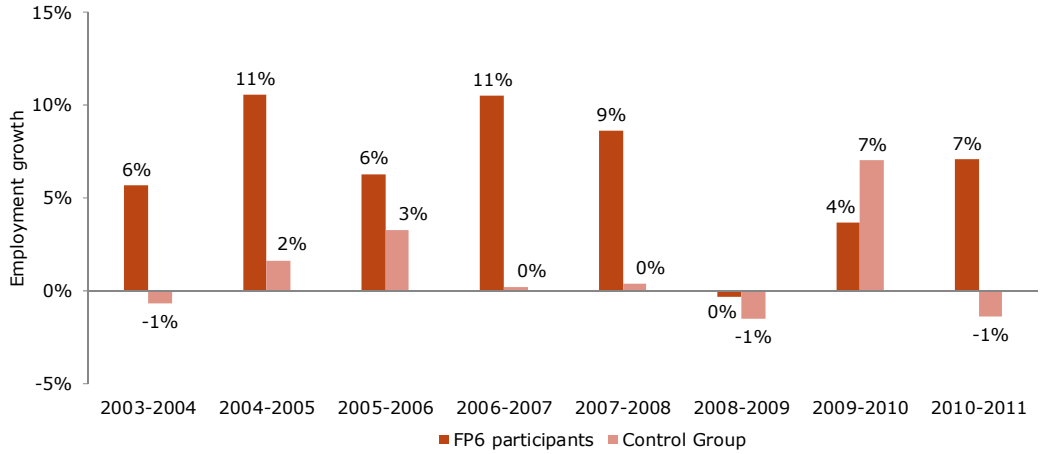


Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

In Figure 4.4 the annual growth rates of FP6 participants in similar priorities to the FP7 Cooperation Programme AND the Research for the benefit of SMEs initiative is presented.

[87] See for more details Annex 1 of Volume II.

Figure 4.4 Annual employment growth of SMEs participating in the FP6 Cooperation Programme AND the Research for the benefit of SMEs initiative compared to matched non-participants (control group)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

The annual growth rates of the FP6 participants were almost every year higher than the rates of the control group, except in the period 2009-2010. Between 2003 and 2004, one year after the start of the first projects in FP6, SMEs participating in FP6 show an employment growth rate of 6% whereas the control group decreased with 1% in employment, hence also here a difference of 7 percentage points. Eight years after the start of FP6 SMEs in FP6 have grown on average 64% in the period 2003-2011. In the same period, for the control group employment grew with only 9%, so a difference over the entire period of 55 percentage points. Also over a longer period, SMEs participating in the Framework Programme have a considerably higher employment growth than non-participating SMEs in the control group over the same period.

SMEs in FP7 expected to show employment growth in the next couple of years

The time horizon for looking at the employment growth in FP7 is only four years after the start of the programme. A comparison of the employment growth of FP6 and FP7 four years after the start of the programme yields the same main result: employment growth rates of the SMEs participating in the Framework Programmes are much higher than those of non-participating SMEs. The level of employment growth rate of SMEs participating in FP6 and FP7 differs. SMEs that have participated in FP7 (the Cooperation Programme and the Research for the benefit of SMEs initiative), show a growth of 37% after four years and for participating SMEs in FP6 this growth after four years is 48%.[88]

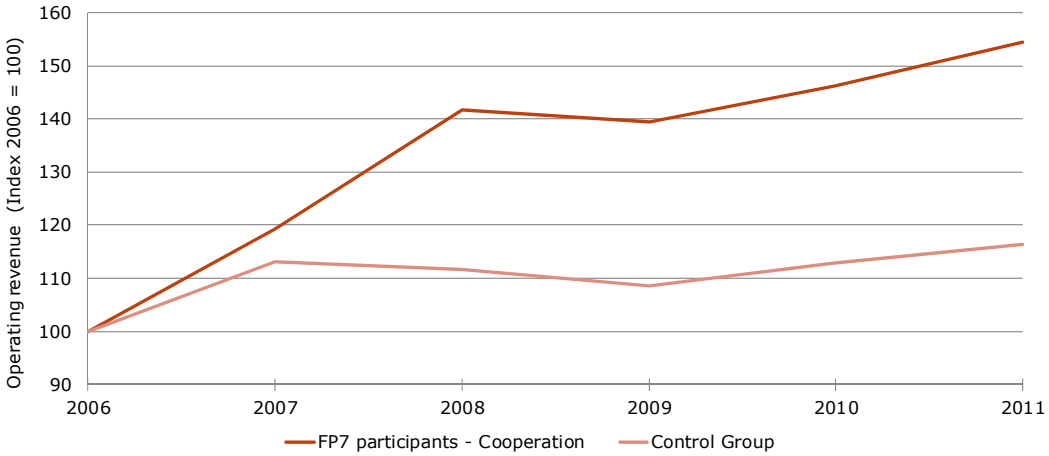
The employment rates of SMEs participating in FP6 and FP7 differ. The exact reasons for these differences have not been investigated, but it is most likely that the differences are due to the differences in economic circumstances. Given the development of the employment growth rate of SMEs participating in FP6 on a somewhat longer time period of eight years and projecting this development on FP7, one might expect that also SMEs that have participated in FP7 continue growing.

[88] Due to the low number of matched SMEs in FP6 priorities similar to the FP7 Cooperation Programme and the insignificant differences, it is only possible to compare significant differences of employment growth between participants of F6 and FP7, and the control group, when the Cooperation Programme and the Research for the Benefit of SMEs initiative are analysed together.

SMEs participating in FP7 have higher growth rates in operating revenue than the control group

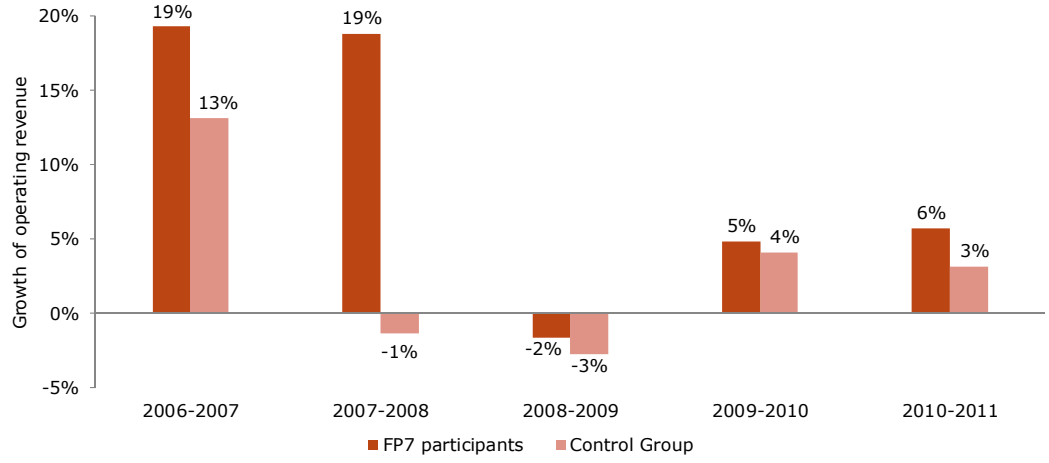
Figure 4.5 and Figure 4.6 show that also the development of the operating revenue differs considerably between the SMEs participating in the Cooperation Programme and the control group. The ups and downs in the growth pattern of the operating revenue over the years are quite similar (except for 2007-2008), but there is a clear distinction between the growth percentages. The growth rate of the operating revenue of SMEs participating in FP7 was considerably larger than that of the non-participants in the control group.[89]

Figure 4.5 Index of operating revenue of SMEs participating in the FP7 Cooperation Programme compared to matched non-participants (control group) (Index 2006 = 100)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

Figure 4.6 Annual growth of operating revenue of SMEs participating in the FP7 Cooperation Programme compared to matched non-participants (control group)



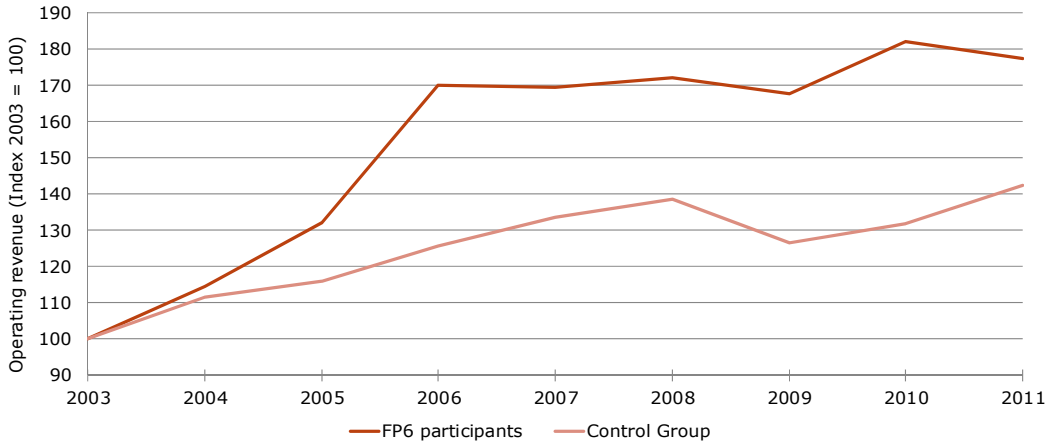
Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

[89] The observed differences might not be (fully) attributed to the participation in the Cooperation Programme because of time lags, possibly implying that the SMEs participating in the Cooperation Programme are the better performing SMEs regardless the participation in this programme.

FP6: Higher growth rates of operating revenue for participating SMEs than non-participants

As for the employment growth, also the growth has been analysed of operating revenue of SMEs that have participated in *FP6* in programmes that are comparable to the Cooperation Programme and the Research for the benefit of SMEs initiative in FP7, because the time after completion of FP7 projects is rather short to look at the impacts.[90] Similar to the result of FP7, differences are found between the growth in operating revenue of SME-participants in FP6 and the control group, as shown in Figure 4.7. The index of operating revenue of FP6 participants is higher than the index of the control group. So, even if a longer time lag is considered for operating revenue, SME-participants in FP programmes perform better compared to non-participating SMEs.

Figure 4.7 Index of operating revenue of SMEs participating in the FP6 Cooperation Programme AND the Research for the benefit of SMEs initiative compared to matched non-participants (control group) (Index 2003 = 100)

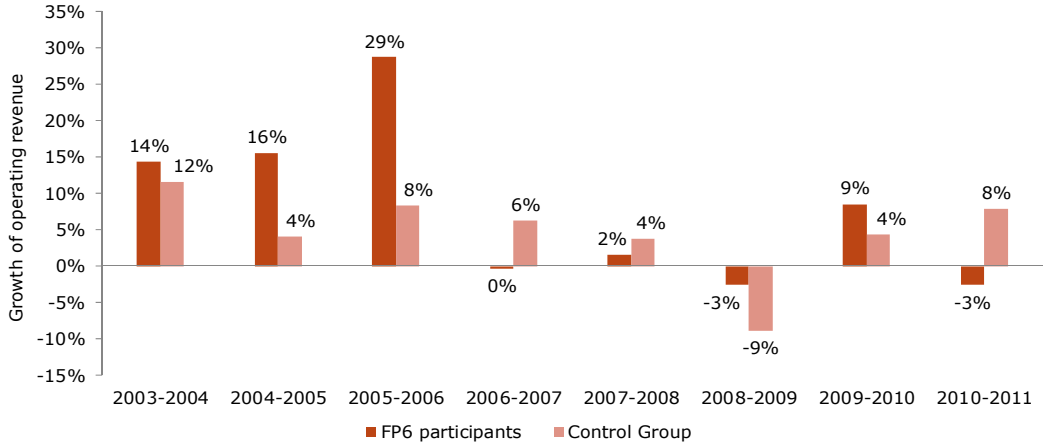


Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

The annual growth rate of the operating revenue of SMEs participating in FP6 in the first three years was especially larger than that of the non-participants in the control group. This is shown in Figure 4.8. After 2006 these differences even became negative, implying that the control group performed better than the participants group (except for 2008-2009 and 2009-2010).

[90] The low number of matched participants and non-participants yield in insignificant differences. Therefore the impact is presented for the Cooperation Programme and the Research for the benefit of SMEs initiative together.

Figure 4.8 Annual growth of operating revenue of SMEs participating in the FP6 Cooperation Programme AND Research for the benefit of SMEs initiative compared to matched non-participants (control group)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

SMEs in FP7 also grow in operating revenue in the next couple of years

The growth in operating revenue of SMEs participating in FP6 or FP7 is significantly higher than growth of the control group. If the growth rate of operating revenue is considered in the first four years after the start of the Framework Programmes, then the growth in operating revenue of FP6 participants shows a slightly different pattern from the growth of FP7 participants. FP6 participants show very large growth rates in the first three years after the start of FP6. After these first three years the growth rate is slowing down and there is a growth setback in 2008-2009.

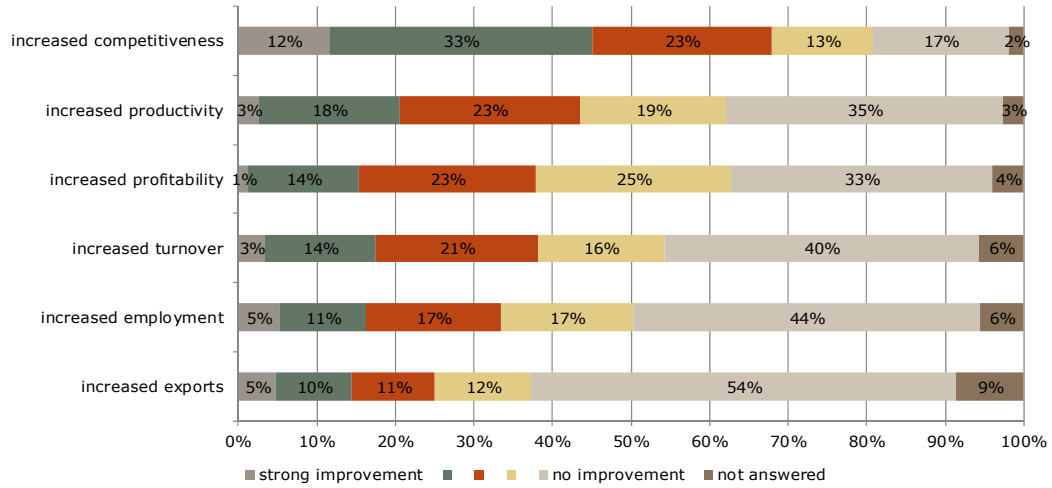
The growth pattern of operating revenue of FP7 participants seems to be different than that of FP6. FP7 participants have increased their operating revenue in the first two periods after the start of FP7. However, the FP7 participants face a setback in 2008-2009. So, the growth pattern seems to be different, but both FP6 and FP7 participants have a setback in 2009. After 2009, FP6 and FP7 participants have again growth in operating revenue. FP6 participants show a slight setback in 2010-2011 whereas the control group continues growing, but still the participants have on average higher growth rates than SMEs in the control group. The results of FP6 indicate that also for a longer time period it might be expected that FP7 participants will outperform non-participants in terms of growth in operating revenue, however to a lesser extent than in terms of job growth, and it depends on how they develop in the period after 2011.

Majority of SMEs in interviews report positive impacts on their competitiveness and other economic effects, a.o. on employment, turnover and profitability

In the SME interviews respondents were asked whether their company's participation in the project resulted in improvements of its economic performance with regard to six different aspects. As shown in Figure 4.9, more than 80% of the SMEs report a positive effect on their competitiveness, of which 12 percentage points saw a strong improvement and 33% a rather strong improvement (sum 45%) vs. 17% no improvement and 13% a small improvement (sum 30%). The remaining 23% of the SMEs reported a moderate increase.[91]

[91] Respondents were asked to answer on a 5 point scale ranging from 1=no improvement at all up to 5= very strong. These results can also be represented as an average score on the scale from 1 to 5: competitiveness 3.1; productivity 2.3; profitability 2.2; turnover 2.1, employment 2.0 and exports 1.8.

Figure 4.9 Impacts of the participation in the Cooperation Programme on the economic performance of SMEs



Source: Austrian Institute for SME Research 2013. SME interviews with 254 SMEs; weighted results.

Impact on competitiveness is linked to SMEs' integration in broader networks, pursue individual technological objectives and understanding of clients' needs

Competitiveness is the ability and performance of a firm to sell its products and services in a given and contested market. For enterprises engaged in innovation, the challenge is not only about reducing costs for a given product or service, but being at the forefront of development. Case studies show that the impact of FP7 participation on SMEs' competitiveness is linked firstly to their integration in a broader network, and secondly to the opportunity to pursue their individual technological objectives thanks to public funding and knowledge access. This includes testing and confirmation of their solutions. Thirdly, within the networks, SMEs increased their understanding of the clients' needs.[92]

Minority of SMEs experience improvement on productivity, profitability, turnover, employment and exports

Compared to competitiveness the impact on the aspects productivity, profitability, turnover, employment and exports is less often reported. More than half of SMEs report almost no or no improvement on these five aspects as shown in Figure 4.9. For exports the effect reported is smallest: 54% of the SMEs reported no increase at all. But those SMEs in the Cooperation Programme that experienced improvement ranging from 38-54%, estimate that the increase is[93]: of turnover + 22%; on employment + 25% and on export + 28%.

Results on impacts from case studies in the Cooperation Programme

Case studies show that economic impacts, i.e. employment, turnover and profitability are seldom directly and uniquely linked to FP7 participation but need further development, investment, and time.

[92] See for illustrations Text box 21, Annex 5, Volume II.
[93] An approximation for the overall average assuming that the group answering 1-4%, scores on average 2.5%, etc.

Most findings with regard to impacts on performance indicators of SMEs participating in the Cooperation Programme emerge from the quantitative analyses made using databases. These results are obtained by comparing participants with SMEs in the control group.

In addition the SME interviews provided the perception of the SMEs themselves on impacts of the Cooperation Programme on the economic performance of their own firm. Figure 4.9 showed that indeed a considerable majority of the SMEs see an impact on economic characteristics of their enterprise: competitiveness 81% and productivity 63%. The score for performance indicators is a bit lower: for profitability 63% see an improvement, for turnover 54%, for employment 50% and for exports 38%. However looking at the quantitative estimates provided, this part of the SME respondents (nearly 50%) estimate that the increases in these variables due to their participation in the Cooperation Programme are: turnover +22%, employment +25% and export +28%. These numbers result from the question 'Did your company's participation in the project result in improvements of its economic performance; if yes with how much percent?' There was no specific time period considered. But comparing the average increase in employment estimated by the SMEs (25%, some 10% for the entire group) with the growth over the period 2006-2011 shown in Figure 4.1 resulting from the quantitative analysis (38 percentage points difference between participants and control group), it shows that their perception is relatively low. Part of the difference of 38 percentage points found in the econometric analysis is however already obtained before impacts of FP7 are there (2006-2007) and in addition it is not easy for the respondents to estimate the development of their enterprise would they not have participated in the Cooperation Programme. For development of turnover/ operating revenue the situation is comparable.

4.1.2 Additional information on economic impacts

SMEs expect economic effects in the coming years

Regarding the development of employment, turnover and profitability, i.e. economic effects on the participating SMEs the following can be noted on the basis of the case studies:

- Most of the SMEs in the case studies see themselves on an innovation path and have a rather clear understanding of what they can expect from FP7: this is a substantial enhancement of their positioning, better reputation, an increase of opportunities due to new contacts, increased knowledge in their own domain and in surrounding domains. But financial incomes linked to the outcomes of the projects are still rare at this moment in time, they are expected in the coming years.
- One often observes that participating research SMEs use FP funding as a source of income. Talking about employment effects, they might mention the 1 or 2 persons they hired with FP-project money. Indeed, a lot of start-ups or very young enterprises participate in FP7 and use this money to finance growth in combination with innovation[94].

[94] See Text box 25, Annex 5 in Volume II for illustrations.

Economic effects most often materialised through more sales to one or more new customers and/or new markets

About the way in which the economic effects are materialised, the SME interviews showed:

- About 45% reported more sales to one or more new customers in other EU Member States, but only 17 percentage points expressed a high or very high economic significance associated with this.
- Sales to one or more new markets in other EU Member States were happening for 37% of the respondents, of these as little as 10 percentage points assigned a high or very high economic significance to this.
- Effects such as founding a spin-off company or having a merger with or acquiring a key competitor happened only for 13%, respectively 9% of SMEs, with only 7, respectively 2 percentage point assigning a high or very high economic significance to this.

Commercial success linked to participation is rather low…

Taking a closer look at the effective and observable commercial success linked to participation of SMEs in the Cooperation Programme, it turns out that this is rather low. Of 62 cases that have been assessed according to this criterion, only four show a very high commercial success, all of them are funded in the thematic field ICT. 12 SMEs show high commercial success, again 9 in ICT. This clearly shows the importance of life cycle duration in a given technology. In other thematic fields, it is observed that coordinating SMEs have a slightly higher commercial success following their FP7 project than others, however it is not going beyond a medium level.

… because at the end of the FP project SMEs need to make considerable investments to commercialise their results

The rather low level of economic effects found in the case studies is mainly explained by the fact that at the end of a project, SMEs still need further steps and considerable investments before they can commercialise their results. Rather often, one FP7 project prepares the next, and commercialisation takes only place after two or three FP projects. Some SMEs have protected Intellectual Property Rights (IPR), but in none of the case studies, SMEs refer to financial income from licencing. However, there are some take-overs and investments by bigger players in the market, that are related to knowhow and IPR held by the SME. For several SMEs, the economic crisis limited options for further development and market rollout.[95]

4.1.3 Other (long-term) outcomes

View on longer-term outcomes

Given this is an Interim Evaluation of a transnational collaborative research programme with a development lifecycle of 7-20 years, the central challenge has been to secure an early view of the likely scale and scope of future impacts. In addition to econometric approaches, the study team has sought to explore realised and anticipated outcomes through SME interviews and the case studies, which comprise targeted desk research and in-depth conversation(s) with beneficiaries to provide a more robust view of achievements and a more careful prospective analysis. However, with the majority of case studies focusing on projects that closed in the preceding 12-24 months, our discussion partners were generally wary of being too concrete about the likely future outcomes. This reflects genuine uncertainty rather than diffidence or false modesty, and also underlines the fact that even with the nearer-market RSME initiative one still has to contend with the classic R&D

[95] See Text boxes 26 and 27 in Annex 5, Volume II for illustrations.

measurement challenges of time lags and attribution. It seems it is almost a misconception to speak about the impact of a single project, as participants explain that progress tends to be cumulative, possibly involving several government projects and various complimentary internal development activities spanning several years.
FP7 is being funded ultimately in order to help sustain or improve European industrial competitiveness, and as such it ought to be contributing meaningful increases in employment and Gross Value Added (GVA) among participants and the wider economy. Hence it would be expected that these sorts of impacts are evident among all FP7 participants, SMEs and larger businesses.

Long-lasting effects according to SMEs: actual cooperation, capacities and competencies in innovation and knowledge

The SMEs participating in the Cooperation Programme were asked which of the outputs discussed during the SME interviews are especially long-lasting or are expected to create especially long-lasting positive effects. The word cloud in Figure 4.10 shows that among all the effects, the actual cooperation comes first; including deepened relation with research partners or customers, new contacts in relevant fields or business areas, i.e. networking etc. Cooperation is one of the core factors of Community Framework Programmes.

Figure 4.10 Long lasting effects of the Cooperation Programme

Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

Findings on impacts from case studies in the Cooperation Programme

Even though the ultimate implementation of innovations is often still to come, some impact is already observable at the SME level: enabling factors that increase the potential of the SMEs through networking and cooperation, knowledge and competitiveness. These impacts show a high economic significance for SMEs and can be regarded as value added through participation in the Cooperation Programme.

Impact of cooperation depends on the SME characteristics and role of the SME

The cases studies[96] confirm that cooperation is one of the enabling factors that increase the potential of the SMEs. Case studies show the variety of effects that result from cooperation and networking.[97]

Impacts on participating SMEs depend on SME characteristics and roles, therefore different patterns can be distinguished:

- Entering new relationships or deepening of existing relationships: new relationships are typically observed with very young SMEs, notably in the thematic priority ICT. A key benefit resulting from networking is access to new potential clients or technology users.

[96] In order to identify impacts on SMEs, the case studies only include projects that have been finished at the moment of selection.
[97] See for illustrations Text boxes 15 and 17 in Annex 5 in Volume II.

- In other settings, participants don't expect so much to enter a new client base, but are focused on technology development and acquiring knowledge.
- SMEs participating in FP7 are dominantly interested in contacts with research organisations or industrial partners. A focus on networking with other SMEs is rather the exception, but there are of course continuing relationships also between participating SMEs.
- One key element in networking concerns links with complementary partners in complex research projects.
- Finally, there are also weaker networks, at least from the perspective of participating SMEs. This perception is most of the time related either to independence of subprojects or to a poor integration of the given SME.

Competences and capacities in innovation and knowledge are also important long-lasting effects as shown by case studies

Cooperation is followed by about equally important long-lasting effects on capacities and competences, and knowledge. Competences and capacities both refer to innovation as in any improvement in different aspects of the execution and management of research and innovation projects, i.e. these enterprises have learned how to better manage (collaborative) research projects, something they will benefit from forever. Knowledge refers to the creation of new knowledge or know-how linked to the research field investigated or the technology developed.

SMEs frequently experienced positive reputational effects

Reputation is defined as the opinion about the SME within a wider community than the concrete project partners. Quite a few SMEs have stated that the participation in an FP project gave them an increase of their visibility as interesting, competent research partners and/or technology developers opening up a whole range of new business- or innovation-related activities. Indeed, SMEs in the case studies frequently report on positive reputational effects as a result of participation in an FP Cooperation project. This concerns the visibility and credibility of the SME and its competencies, both for clients and future research partners. In addition to the reputation of the SME, reputation can also concern the technology they are developing, with positive impacts on the SME as well.[98]

Other long-lasting effects: develop and commercialise products/services and create follow-up projects

Many of the interviewees naturally mentioned that the actual development of a marketable product/service and its commercialisation will create an outstandingly long-lasting effect on the company. This, however, does not include more general process know-how on how to commercialise research output, which was mentioned only in three interviews (as compared to actual commercialisation processes, mentioned 32 times). This is closely linked to the development of new technologies or applications for a technology, which is also frequently named a long-lasting impact on the SME.

Also interesting - and possibly reflecting the fact that the Cooperation Programme often supports experienced, research-intensive SMEs - is the mentioning of follow-up projects or, more generally, the opportunity to continue with certain research activities among the long-lasting effects.

[98] See also Text box 20 in Annex 5, Volume II.

Less important long-lasting effects: job creation and gaining resources

Although mentioned in some interviews, it seems interesting that the creation of new jobs is ranked rather low among the long-lasting effects but apparently - this is also backed by some of the case studies - job creation is not often a result even if new products were developed or new markets entered. However, certain effects - as for instance job creation - might very well be among long-term effects, which cannot be seen, yet. Gaining access to resources, including human resources, research infrastructure and private or public funds seems to be less important for the SMEs interviewed, which again is likely linked to that fact that the "typical" Cooperation participant predominantly seeks other benefits from participation than co-financing of innovation activities.

Only potential impacts on society reported[99]

For the impacts on society a distinction is made between societal problems that are addressed by the research project and societal problems that are solved or reduced by the project, and more precisely by SMEs' participation to this project. In most case studies it is too early to expect concrete benefits to society due to innovative problem solving, but various challenges are addressed by funded projects.
Apart from exceptions, there are only potential impacts on society to be reported, mainly due to the time needed for outputs to diffuse into society, and the difficulty to identify them. Basically, most products and services under development in FP7 are not yet or only recently commercialised, so even if they have a high potential, it is not realised yet.

Altogether, out of 63 observed cases, only 17 reported high (13) or even very high (4) impact on society. Only in the thematic area Energy of the Cooperation Programme, this holds for every second case study (5 of 10).
Clearly, there is a link between problem-oriented calls and potential impacts of research projects on society. Still, in fields such as health research, due to well-known length of development cycles, the realisation of benefits on society on the individual project level is not yet observable.[100]

Small majority of stakeholders foresee positive impact on society

Stakeholders have a rather limited and impressionistic view of programme impacts, however a small majority of them believe the programme is having a positive impact on European industry and society.

4.2 European Added Value (EAV)

European Added Value - see introduction of the concept in Section 1.5- is defined in this context as "the value resulting from EU support for RTD activities which is additional to the value that would have resulted from RTD funded at regional and national levels by both public authorities and the private sector".

The evaluation questions in this area are:
Q11. Has the support from the initiative resulted in values which are additional to the values that would have resulted from RTD funded at regional and national levels by both public authorities and the private sector?
Q12. To what extent do actions at EU level complement and enhance the impact of measures taken at national level by governmental and non-governmental (private sector) actors?

[99] As mentioned before with impacts on society the focus is on the effects that come in addition to the economic effects discussed before that are of course also important effects on society.
[100] See for illustration Text boxes 22 and 23 in Annex 5, Volume II.

Findings on EAV of the Cooperation Programme

1. There is some evidence for substantial EAV from the Cooperation Programme through its support for SMEs' research and innovation activities, which are subject to major market failures and attract limited public support in a majority of EU Member States.
2. As it is still very unusual for SMEs to secure national funding for Cooperation projects with partners from abroad, a range of effects contribute to EAV, such as access to knowledge from abroad and access to international markets.
3. In some countries the SMEs' motivation for participation in the Cooperation Programme was "access to financial assistance not available nationally or regionally" and as much as 74% of all participating SMEs state that the effects realised could not have been achieved in a national or regional funded programme or through private funds.
4. The following particularities of FP7 funding in the scope of the Cooperation Programme compared to national funding are relevant: scope and size of the project, access to knowledge and competencies on the international level and access to international markets and business partners.

When discussing EAV attention will be paid to both:

- EAV at the input side: FP7 should focus on topics and activities that do not get (sufficient) attention from existing initiatives in EU Member States from public or private sector agents;
- EAV at the output side: the extent to which FP7 activities deliver more benefits compared to existing initiatives in EU Member States of public or private agents.

Stakeholders indicate that Cooperation Programme provides substantial EAV

Our interviews with Member State officials and National Contact Points provided extensive feedback on European Added Value. Taken together, their arguments suggest that the Cooperation Programme provides substantial EAV through its support for SMEs' research and innovation activities at the European level and in particular that this important category of economic actors, which are subject to major market failures, attract limited public support in a majority of the EU Member States. The economic crisis has made the situation worse, with contributors from several different Member States (e.g. Italy, Spain) noting that pressure on public finances means there is very little money available to support SMEs nationally and the EU funds are the only meaningful sources of public assistance for research and innovation projects.

The funding gap is not universal. There are exceptions, with substantial national and regional support for SMEs' innovation activities on offer in several MS, e.g. Belgium, France, Germany, Sweden and the UK. In these cases, the EAV is not simply a question of public finance, but rather the availability of a support measure that stands apart from national efforts in terms of its international scope and the scale of public investment available.

National funding for international cooperation is not available and …

On the first point, it is unusual for businesses to be able to secure national funding for the cross-border activities of an international partnership. Equally, for SMEs based in smaller EU Member States, FP7 provides an opportunity to work with technologists and supply chains that may not be present nationally. For most actors in most Member States, an EU scheme enlarges the pool of collaborators to a degree that is really rather helpful. Lastly, there was also a sense that national R&D programmes for SMEs, where they do exist, may be more generic and will not seek to actively engage innovative SMEs in strategic industrial research, whether that is targeting advanced therapeutics or breakthroughs in renewable energy systems. The Cooperation Programme does this explicitly, seeking to exploit the intrinsic qualities of SMEs in pursuit of major innovations.

… size of projects supported by EC are much larger

On the second point, Member State officials and National Contact Points (NCPs) note that national awards may have a financial value measured in tens of thousands of Euros, while EU awards provide support to individual businesses that is likely to be one or even two orders of magnitude larger in cash-equivalent terms. That size differential may not matter in all cases, however development and prototyping is typically much more involved and costly than the research itself and as such, FP7 can arguably take participants further down the commercialisation route than national schemes.

For the most part, the Member State officials and NCPs have no good view of programme outcomes, as noted at several points already, and as such are not able to comment on the actual EAV delivered by the Cooperation Programme. However, there was a sense that the Cooperation Programme sets a pretty high bar in performance terms - it is more demanding on participants as compared with national measures, typically - and that produces worthwhile benefits for SMEs, in terms of their in-house management competence and general professionalism. Several NCPs remarked that the challenging and competitive nature of the Cooperation Programme produces another benefit, which is an enhanced reputation for participants. This is somewhat intangible, but is thought to add to SMEs brand value.

FP7 does not provide equity finance to fund follow-on development in part because of the historical focus of DG RTD on research and in part because the financing of commercialisation proper is addressed by the European Structural Funds, European Investment Fund (EIF) and by the market. The EVCA annual report shows the private sector is running hundreds of investment schemes in Europe and that these VC and other funds are busy financing thousands of business development projects annually.[101]

Additionality in general considerably high

The SME interviews mirror the feedback from Member State officials, where a small majority of respondents state that the additionality of the Cooperation Programme is substantial: 53% of the SMEs would not have been able to undertake their project at all. It is also often stated that they would have undertaken the project with their own resources but with a reduced scope (25%) or at a later date (17%). Full deadweight loss is only there according to 2% of the SMEs: they would have undertaken the project with their own resources without reducing scope.

Also SME participants value EAV highly

For two third of SME participants access to financial assistance not available nationally or regionally, is an important motive to participate

From the SME interviews it shows with regard to EAV at the input side, that the motivation for participation *"access to financial assistance not available nationally or regionally"* seems in particular highly relevant for SMEs from Greece, Israel, Italy, and several other associated countries. For example 83% of all Italian SMEs interviewed state this; compared to overall: 66%.

[101] However the availability of venture capital for small enterprises is rather limited

The majority of SMEs indicate that the results could not be achieved in a national or regional funded programme or through privately financed research projects

With regard to EAV at the output side SMEs have been asked in the interviews whether the effects realised could also have been achieved in a national or regional funded programme or through privately financed research projects.

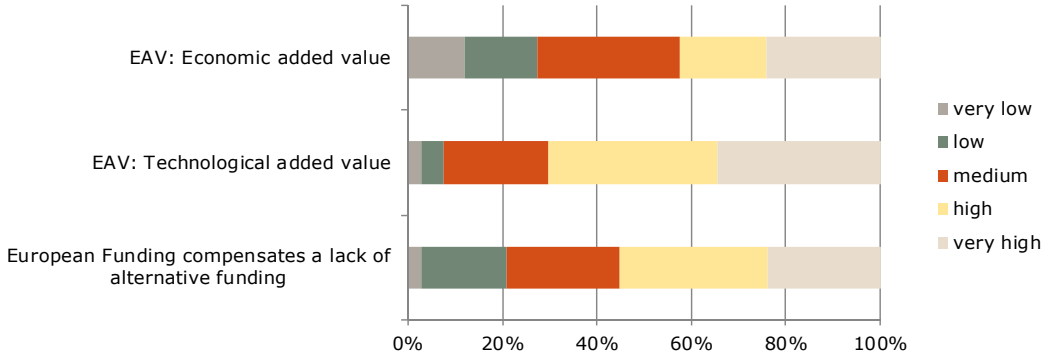
- Only 21% of the respondents in the Cooperation Programme answer yes and 74% no. EAV is highest with regard to obtaining new knowledge.
- With regard to effects on the economic performance of the enterprise, the differences are smaller: 34% answer that these effects could also have been achieved with projects financed in their own country, vs. 62% that state this was only possible with EU level support.
- With regard to behavioural additionality the scores are: 31% say this could also have been achieved nationally and 63% answer no.

So across these three aspects of EAV, a clear majority of the interviewed SMEs report EAV at output side.

Also in case studies high assessment of EAV

With regard to EAV, the assessment of case studies is far more positive than with regard to impacts on SMEs and society (see Figure 4.11).

Figure 4.11 Assessment of the European Added Value in Cooperation cases



Source: Technopolis Group, analysis of 64 case studies in the Cooperation Programme.

Focusing on the question "To what extent do actions at EU level complement and enhance the impact of measures taken at national level by governmental and non-governmental (private sector) actors?" the following particularities of FP-Cooperation funding compared to national funding opportunities emerging from the cases studies[102] should be stressed:

1. Scope and size of the project. One very important aspect of European funding is the scope of these projects. Scope refers to the financial dimension, to the consortium, to the geographical dimension and last but not least to the longer time-to-market. Even if, size does not necessarily lead to quality or efficiency, FP7 projects cover a niche for projects with specific research endeavours, which crucially depend on the particular design of the FP Cooperation Programme.

[102] For illustrations of EAV see Text boxes 30 - 34, Annex 5 in Volume II.

2. International dimension: access to competencies. A second aspect of EAV is linked to access to knowledge and competencies on the international level. The added value arises either, because these competencies are not available locally, so SMEs need to broaden cooperation in R&D to the international level, or the research problem at stake has a transnational dimension (e.g. linked to regulations), so that various stakeholders and perspectives need to be integrated in the consortium. Finally, for SMEs, this international dimension is more difficult to access than for large multinational companies. Hence for many SMEs, the geographical scope is a unique chance for knowledge transfer out of the ordinary.

3. International dimension: access to markets and business partners. As shown in Figure 4.11 above, economic EAV is assessed to be lower than technical EAV. Still, in several cases, it has become a core factor. Testimonies show that access to international markets has a value added not only if it translates directly into turnover, but also if it is related to a better knowledge of market cultures. In this dimension, cooperation is most satisfactory, if it leads to sustainable contacts. Interestingly, several projects refer to access to extra-European markets, such as Brazil, China or Taiwan.

4. Cooperative R&D: lack of funds on national level. From the preceding points it clearly turns out that in general, transnational cooperative research projects of the scope funded in the FP Cooperation Programme are not addressed by national or regional schemes. However, some SMEs turn towards EU funding even if their research requirements don't necessarily need this dimension, as they face a lack of alternative funding opportunities. This aspect, most evidently, differs according to national contexts. Notably those countries that are particularly affected by the 2008 financial crisis, like Spain, Greece or Portugal, lead to budgets cuts in funding of R&D and to reduced private demand of innovative products. In other countries like the UK or Germany, SMEs have options to get national funding. Funding rates might be lower, so there is some risk of crowding out due to attractive rates in FP7 projects. However, these are seldom explicitly referred to by SMEs.

Support by the Cooperation Programme often complements national support and …

A first observation is that a considerably high number of SMEs participating in FP7 are young companies, often spin-offs of universities, research centres or research departments in big industry. These companies often benefit from national support structures or at least from the national context (i.e. the university they come from). Most participating SMEs are experienced in research and development. Nearly two thirds (64%) of case-study SMEs have received funding for research and development on the national or regional previously to the FP7 project. The FP Cooperation Programme therefore complements national support as far as it attracts SMEs that are already "trained" for research.

… national public or private funding is often used to allow commercialisation of the results of the Cooperation Programme project

The second observation relates to the financing of follow-up activities after the end of the FP project. On the path towards commercialisation, SMEs regularly use national public or private funding to allow commercialisation of the results of FP7. More generally, a typical outcome of research projects is 'another research project'.

This concerns both further FP projects, but also projects benefiting from national funding or proprietary development contracts.[103]

4.3 Behavioural additionality

Behavioural additionality concerns the effects on the funded SMEs' behaviour and strategy as a result of their participation in FP7, i.e. receiving government subsidies.

The evaluation questions in this area are:

Q13. Have the participating SMEs changed their behaviour as a result of the participation in the initiative?

Q14. Have participating SMEs increased their collaboration with new partners at national/EU level (enterprises, research organisations, universities) as a result of participating in the project?

Findings on behavioural additionality of the Cooperation Programme

1. A significant part of SMEs state that they have changed their innovation behaviour and attitude due to their participation in the Cooperation Programme. Results from the SME interviews show that SMEs are now more aware of the potential benefits of research: they professionalise their R&D and innovation activities (36%), do research more often (35%) or more regularly (32%) and especially get involved in collaborative R&D and innovation activities more often (59%) etc. and that is considered to be among the most long-lasting effects of their participation in the Cooperation Programme.
2. However, most SMEs participating in the Cooperation Programme are already innovation oriented (SME interviews: 91% already involved in R&D and innovation before the project[104]), so although the effect is there it is not often a turnaround effect for SMEs that are not yet involved in any R&D and innovation activities.

Stakeholders have limited insight in behavioural additionality of SMEs

As noted at several points above, stakeholders have a rather limited view of FP7 programme outcomes and that includes the effect of FP7 on SME innovativeness or behaviour. Commission officers and National Contact Points (NCPs) have some thoughts however on this issue and several suggested the Cooperation Programme was a good platform for SMEs to sharpen their R&D skills. Even where they have strong internal capability already, the projects are quite large and involve international partnerships that will stretch most organisations. Stakeholders noted that the less-experienced SMEs and first-time participants tend to derive greater learning and behavioural benefits from the programme as compared with the organisations that have been involved in multiple projects over many years.

A substantial part of SMEs state to have changed innovation behaviour and attitude due to the participation

Asked about the effects of their participation in the Cooperation Programme, the responding SMEs mentioned especially the following[105]:

- 59% stated to get involved in collaborative research and innovation more often;
- 38% get involved in research with a longer 'time-to-market';
- 36% professionalised its research and innovation activities;
- 35% conduct research and innovation more often;
- 32% conduct research and innovation more regularly.

So there is a significant share of SMEs supported by the Cooperation Programme that state that they have changed their innovation behaviour and attitude due to the participation and that is considered to be among the most long-lasting effects of their participation.

[103] See also Text box 35, Annex 5, Volume II.
[104] See Annex 3, Volume III, Figure 2.
[105] See Annex 3, Volume III, Figure 33.

Behavioural additionality includes more conscious structuring of innovation activities, increased investments and boosting of innovation

One relevant issue with regard to behavioural additionality is that many SMEs participating in FP7 are already innovation oriented before joining the project. Hence for these enterprises the project experience will be coherent with their innovation behaviour but it does not change it that much.

When behavioural changes do occur, they are often related to increased visibility and confidence of the SME leading to more ambitious research and innovation projects, increased cooperation and increased internationalisation. The experience in international cooperative research projects leads to more conscious structuring of innovation activities, increased investments and boosting of innovation.[106]

Innovativeness of SMEs improved due to a combination of confidence in new partners and clarity or transparency concerning cooperation

The next question with regard to behavioural additionality is whether participating SMEs have increased their collaboration with new partners at national/ EU level as a result of participating in the project?

Indeed, new partnerships and internationalisation are two core benefits of FP7 participation of SMEs, as has been discussed above in Section 4.1 on impacts on the SME level. Here the focus is on learning effects that lead to a change in the attitude, openness and to professionalism in relation to new partners. One can observe a combination of confidence on the one hand and clarity or transparency concerning cooperation processes on the other, which increase potential innovativeness of participating SMEs.[107]

4.4 Innovation

Innovation refers to bringing a new or significantly improved product or service to the market, implementing new manufacturing, organisational or marketing processes. So in line with the OSLO Manual innovation also includes a new organisational method in business practices, workplace organization or external relations.

The evaluation question in this area is:

Q15. Have the SMEs participating in the programme become more innovative, in terms of for example introduction of innovations new to the company or the market?

[106] See Text box 36 in Annex 5 in Volume II illustrating effects on innovation behaviour: structuring and increased engagement.

[107] See Text boxes 36, 37 and 38 in Annex 5, Volume II give additional illustration of effects on behavioural additionality.

Findings on innovation with regard to the Cooperation Programme

1. There is some doubt on the extent to which the Cooperation Programme is helping SMEs to actually innovate.
2. However, considering that the majority of SMEs created new innovation-related partnerships and networks, became more aware of the potential benefits of innovation, became more professional in their innovation behaviour and managed to create innovations new to the market, it may be concluded that the majority of SMEs funded have indeed realised some innovation-related effects of their participation.
3. The effects on innovation seem to be cumulative, i.e. each participation and its effects build upon previous participations and the respective effects. Thus, newcomers realise fewer or less strong effects with regard to their overall innovativeness than SMEs that participate in the Cooperation Programme more often.

Stakeholders have some doubt on the extent to which the Cooperation Programme is helping SMEs to actually innovate

The Cooperation Programme funds pre-competitive research, the results of which are by definition some way off being ready to commercialise. SMEs may be making contributions that are a little closer to market, however the know-how or Intellectual Property (IP) they do get access to will require further development, investment and several years before it could reasonably be called an innovation. In practice, SME participation in FP7 projects tends to address a narrow aspect of a broader innovation objective. A small minority don't believe the Cooperation Programme is helping SMEs to innovate, or at least not to the extent that it should. This view seems to relate to a more general anxiety that SMEs are sometimes included in project teams to satisfy the Commission's requirements, i.e. the SME targets. Such SMEs might have a pretty peripheral role in the project and derive very little benefit from the experience. Indeed, the case studies have shown that such SMEs do exist. See also Section 3.2 on the role of SMEs in Cooperation projects.

SMEs are very positive about the effect on their innovation activities

The overall question of whether or not the SMEs have become more innovative at large requires a combination of several findings but can be answered with "predominantly, yes" on the basis of the SME interviews, the majority of SMEs:

- created new innovation-related partnerships and networks;
- became more aware of the potential benefits;
- acted accordingly in terms of professionalization and other behavioural aspects.

As much as 70% of all participants in the Cooperation Programme state in the SME interviews that following the participation in the project they implemented an innovation.[108]

- 74 % of these SMEs (this is 52% of all participants) state that this innovation was new to the market;
- 82 % of these SMEs (this is 58% of all participants) state that this innovation was new to the firm.

These percentages are rather high, but one should keep in mind that innovation means available at the market and not necessarily being successful (already).

The majority of SMEs funded have realised some innovation-related effects of their participation, most did realise a multitude of effects. The overall variety of effects on SMEs' innovativeness is quite large.

[108] It should be noted that these statements (reported in Table 22 in Annex 3, Volume II) should be interpreted carefully as it was also learned - especially from case studies - that such innovation new to the market might be worked on, but actual implementations new to the market are rare. Mostly the actual commercialisation only takes place after completion of the FP7 project.

The effects seem to be cumulative, i.e. each participation and its effects build upon previous participations and the respective effects. Thus, newcomers realise fewer or less strong effects with regard to their overall innovativeness.

But from case studies a less positive picture emerges

Case studies lead to a more critical in-depth view than standardised interviews, when asking whether the SMEs participating in the projects became more innovative, in terms of for example introduction of innovations new to the company or to the market. Overall and in the longer term, Cooperation projects are relevant for innovations, but only exceptionally do they directly lead to the introduction of innovations in terms of implementation and/or commercialisation. Tangible outcomes of Cooperation projects are most of the time pilots or demonstrators. SMEs interviewed for case studies regularly refer to knowledge acquisition implemented in further projects. Market implementation as a direct result of a FP Cooperation project is exceptional. Nonetheless, SMEs participating in these projects are well positioned to take advantage of the project, in their innovative activities. In so far, the high percentage of SMEs interviewed that claim having implemented innovations should probably be interpreted as relevant contributions to their innovation strategy.[109]

[109] As mentioned in the previous section, Text boxes 36, 37 and 38 in Annex 5, Volume II give additional illustration of effects on behavioural additionality. Showcases as presented in Annex 6 in Volume II illustrate in a comprehensive way the interaction of the SMEs, its innovations and its FP7 participation.

Part III Evaluation of the Research for the benefit of SMEs initiative in the Capacities Programme

This part of the evaluation report presents the evidence gathered with regard to the evaluation aspects of the Research for the benefit of SMEs initiative based on various sources and methodologies as described in Section 1.3:

- relevance, effectiveness and efficiency in Chapter 5;
- impact, additionality (European Added Value, behavioural additionality) and innovation in Chapter 6.

The Research for the benefit of SMEs initiative (RSME) in the Capacities Programme consists of two different schemes as explained in more detail in Section 2.4:

- Research for SMEs;
- Research for SME associations.

The maximum overall amount for Community financial participation in the Seventh Framework Programme was determined to be € 50 521 million of which € 4 097 million or 8% was allocated to the Capacities Programme[110].

For the two specific SME schemes in the Research for the benefit of SMEs initiative € 1 336 million was reserved, nearly 3% of the overall budget for FP7.

Section 5.2.1 hereafter shows that in the period 2007 - February 771 projects have been started. In total there are 6 947 participations (not unique organisations as some participate in more projects) of which 4 276, or 62% are SMEs.

[110] European Commission (2006), Decision No 1982/2006/EC.

5 Relevance, effectiveness and efficiency of the Research for the benefit of SMEs initiative

5.1 Relevance

With relevance, the extent to which an intervention's objectives are pertinent to needs, problems and issues addressed is being assessed. So the issue is whether the schemes of FP7 considered in this Interim Evaluation are properly linked to the actual needs of the suggested target groups, e.g. SMEs and SME associations.

The evaluation questions in this area are:
Q1. Are the overall objectives of the initiative adequately and clearly specified?
Q2. To what extent are the initiative's objectives pertinent in relation to the evolving needs and priorities of SMEs?
Q3. Are the objectives clearly communicated to and understood by the SMEs?

Findings on relevance of the RSME initiative

1. The RSME initiative continues to be heavily oversubscribed and demand has continued to grow in line with expanding budgets, which indicates the relevance of the initiative to Europe's SMEs.
2. However, the analyses reveal that a majority of the participants were already active with research and that a significant minority had a dedicated R&D budget and R&D staff. These SMEs are not the RSME scheme's primary target group, which may impact its overall effectiveness.
3. As with other parts of FP7, the RSME rationale and objectives are directional rather than SMART (Specific, Measurable, Attainable, Relevant and Time-based), which affects the possibility of assessing whether the objectives of the programme are achieved.
4. The majority of SMEs funded by the Research for SMEs scheme knows very well what the objectives of the scheme are.
5. The motivations of SMEs to participate in the initiative (access to knowledge, the opportunity to work on specific issues and on strategic issues, lack of funding or financial assistance available on national or regional level, access to research and technologies in other EU Member States and to have "access to new customers and new markets") are in line with its aims.
6. The Research for SME association scheme responds rather well to the needs and priorities of the SMEs but some critical issues also emerge. One critical issue is that RSME projects may actually not be driven by SME associations but 'captured' by Research and Technology Organisations (RTOs) and these RTOs often lack a deeper understanding of the actual industry and market needs.

5.1.1 Programme objectives and relevance for SMEs

The overall objectives of RSME are quite clear

The RSME initiative's overall objectives refer clearly and explicitly to strengthening the innovation capacity of Europe's SMEs, such that they can contribute more fully to the development of new products and processes and market expansion, to become economically more competitive (see Text box 5.1).

But SMART objectives are not formulated

As with other parts of FP7, the RSME rationale and objectives are - as shown in Text box 5.1 - directional rather than SMART (Specific, Measurable, Attainable, Relevant and Time-based) and are not accompanied by any substantive analysis of the SME innovation challenge in Europe. There is an unarguable statement that SMEs are at the heart of European industry, are present in large numbers in most value chains, and are responsible in some degree for the transformation of knowledge into goods and services. The RSME rationale does not explain why SMEs under-invest in innovation and indeed why they should be innovators, rather than adopters of innovations, and what kinds of policy response might be most effective in correcting for these shortcomings.

Text box 5.1 Objectives Research for the benefit of SMEs schemes

Capacities programme in general

"This specific programme will enhance research and innovation capacities throughout Europe and ensure their optimal use". To this seven initiatives are listed of which the second is formulated as 'strengthening innovative capacities of SMEs and their ability to benefit from research'.
This second initiative is named Research for the benefit *of SMEs* for which one third of the Capacities budget is reserved (€ 1 336 of € 4 097 million). In Annex I of the Council Decision the objectives and approach are formulated:

Objectives

"Strengthening the innovation capacity of European SMEs and their contribution to the development of new technology based products and markets by helping them outsource research, increase their research efforts, extend their networks, better exploit research results and acquire technological know-how bridging the gap between research and innovation".

Approach

…

"Financial means will be allocated through two schemes: Research for SMEs and Research for SME associations."
"The first targets mainly low- to medium-technology SMEs with little or no research capability, but also research intensive SMEs who need to outsource research to complement their core research capability. The second targets SME associations which are normally best placed to know or identify the common technical problems of their members, to act on their behalf, and to promote the effective dissemination and take-up of the results."
…

Activities

"The following two SME specific schemes will be implemented:
Research for SMEs - This scheme supports small groups of innovative SMEs to solve common or complementary technological problems. Projects, which are relatively short term, must be centred on the innovation needs of the SMEs which outsource research to RTD performers and must demonstrate a clear exploitation potential for the SMEs concerned.
Research for SME associations - This scheme supports SME associations to develop technical solutions to problems common to a large number of SMEs in specific industrial sectors or segments of the value chain through research needed, for example, to develop or conform to European norms and standards, and to meet regulatory requirements in areas such as health, safety and environmental protection. Projects, which can have a duration of several years, must be driven by the SME associations which outsource research to RTD performers for the benefit of their members and must involve a number of individual SMEs.
Common features of the schemes: (a) Other enterprises and end-users can participate in the schemes if it is in the interest of the SMEs or the SME associations. (b) The projects should include, in addition to research, activities to promote the take-up and effective exploitation of the research results, such as, testing, demonstration, training, technology transfer, knowledge management and IPR protection. For Research for SME associations, projects should also include activities to disseminate effectively the research results to the members of the SME associations, and if appropriate, more widely. (c) Special rules will apply for ownership and access rights for the two schemes.
The clear focus will be to support research projects. In addition, support will be granted to national schemes providing financial means to SMEs or SME associations to prepare proposals for actions under 'Research for the benefit of SMEs' with the aim of encouraging the establishment of new national schemes or expansion of the existing ones."

Source: Corrigendum to Council Decision 2006/974 of 19 December 2006 on the specific programme: 'Capacities' implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013).

Literature gives substantiation for activities provided for by RSME

The RSME rationale and objectives resonate with the case for public intervention set out in the academic and policy literature, reflecting longstanding arguments about acute levels of under-investment in R&D by SMEs in general and Europe's SMEs in particular (in comparison with their counterparts in Japan or the US).

In addition, the RSME initiative cites the importance of absorptive capacity and acknowledges the tendency for SMEs to maintain the smallest possible complement of professional and technical staff in order to function in the short term, which impedes their ability to articulate or execute new business development opportunities.

There is a presumption that there remains an important gap between what the market will provide, through individual SMEs or service organisations, by way of innovation investment and activity and that which is socially optimal. Studies suggest government fiscal policies and grants can increase private investment in innovation and trigger associated improvements in competitiveness and growth: social benefits are substantial too. The power of these arguments is demonstrated empirically through the widespread support for research and innovation in SMEs found across EU Member States. In many cases, those national or regional programmes are somewhat limited in scale and scope, however, notwithstanding that unevenness, these initiatives do suggests the legitimacy of public intervention.

Research associations and technology consultants active in RSME fulfil different, complementing roles towards SMEs

There is a tendency in the market in which innovation of SMEs is stimulated through the creation of industry research associations[111] on the one hand and specialist technology consultancies on the other. The associations provide a mechanism through which to aggregate demand for generic technical services and costs are shared amongst a larger population. Technology consultants will tend to do custom made work, or small multi-client projects, and are in essence a form of sectoral specialisation; a division of labour within the wider economy. Both market responses have their limitations: club research works best with incremental innovation and particularly the diffusion of good practice that has already been developed (tightening finances have made club research increasingly problematic for most industries), while consultants provide a more hard-hitting approach to technology development but will be very much more expensive proportionately.

Literature is less clear on what kind of support stimulates SMEs' innovation in the best way

What is less clear is the extent to which the various market failures confronting Europe's SMEs can be addressed most efficiently through fiscal measures or targeted programmes on the one hand or national or European policies on the other. In practical terms, it seems likely that a mixture of policies and levels of intervention is necessary in order to address multiple different market and system level failures. So, whereas a tax credit may lower the cost of R&D to a point that the risk / reward ratio works for a larger proportion of all SMEs, it is not going to tackle absorptive capacity and is also unlikely to do much to overcome various coordination and system level inefficiencies.

Demand larger than available budget…

The FP7 monitoring data show the RSME scheme continues to be heavily oversubscribed and demand has continued to grow in line with expanding budgets, which indicates the relevance of the initiative to Europe's SMEs.

[111] In practice, industry research associations do not often participate in the research for association schemes, as an analysis of the RDI orientation of associations has shown (see Annex 4 in Volume II).

…but RSME reaches mostly already research active SMEs, not being the target group

The results from the SME interviews however raise a concern, inasmuch as they reveal a majority of the participants were already active in research and that a significant minority even has a dedicated R&D budget and R&D staff. These types of businesses are not the RSME scheme's primary target group, which may impact its overall effectiveness. Our interviews suggest that many high-tech SMEs find the RSME scheme more attractive / relevant than the Cooperation Programme as a result of its non-thematic approach and support for smaller and shorter duration projects that are nearer to market in their conception.

Stakeholders see relevance for SMEs…

In general, stakeholders are positive about the relevance of the RSME scheme to the innovation needs of Europe's SMEs inasmuch as it provides businesses with access to the kind of investment funds, technical skills and market access that they need and cannot easily replicate privately or even with national support. The enthusiasm for the scheme is linked in some degree at least to the level of national support that is available for SMEs (one can see that in the monitoring data).

…with some critical notes

There is a minority that criticise the relevance of the scheme, but this was related to two issues that had more to do with the detail design of the scheme rather than its relevance: the appropriateness of several of the scheme's most fundamental rules (e.g. giving the money to the RTOs; the requirement to involve partners from two or more Member States). There was also scepticism in several cases about the need for a European instrument, while acknowledging the fact that many Member States offer very limited support for research and innovation in SMEs.

Two third of cases show (high) relevance of Research for SME scheme to needs and priorities of SMEs

Case studies confirm that the Research for SMEs scheme responds rather well to the needs and priorities of the SMEs, but not optimally: Relevance has been assessed for 45 SMEs participating in Research for SMEs. In 8 cases, the scheme was highly relevant, in 20 cases it was relevant for the SME. This corresponds to nearly 2 out of 3 cases.

The Cooperation Programme seems to be more often relevant to SMEs' needs

The Research for SMEs scheme is considered to be (highly) relevant for nearly 2 out of 3 cases. Although the scheme has been developed especially for the benefit of SMEs, this result is less good than for SMEs participating in the Cooperation Programme, where nearly 3 out of 4 cases have been assessed as (highly) relevant for the SMEs observed.

Most SMEs in cases Research for SMEs scheme were already experienced with the use of public funding

Taking a closer look at the participating SMEs, it turns out that the Research for SMEs scheme fits best to SMEs that are particularly innovative. In the case studies, one out of three SMEs participating in the scheme has already participated in a EU FP Cooperation Programme, two out of three have received national or regional funding, and every fifth SME said it had already participated in the Research for SMEs scheme before. Altogether, in only 13 cases, the SME representative stated that they did not receive any public funding for R&D prior to this project.

The Research for SMEs scheme seems to be less relevant for SMEs expecting access to new markets

Furthermore it is not surprising that for SMEs motivated by the hope of accessing new markets, relevance is not as high as for research oriented SMEs that fit well in long term orientation of FP research projects. SMEs without considerable primary experience in cooperative R&D before participating to FP7 often feel less concerned with programme objectives. This does not exclude any benefit from participation.

However, case-studies show that the scheme can be "captured" by research organisations well aware of European research funding mechanisms and schemes, who invite SMEs to participate. As a matter of fact, the one particularity of the Research for SMEs scheme is that EU funding is provided to SMEs who then use this money to buy in research services from RTOs.

The configuration, where Research for SMEs supports[112] "*small groups of innovative SMEs in solving common or complementary technological problems*" is often based on the initiative of an RTO who plays a key role in defining the SMEs problems. In particular, these SMEs tend to expect R&D activities closer to the market and feel disappointed if the project ends with a pilot that is not further developed by other partners after the end of the project (see also the discussion of commercialisation)[113].

Association projects score quite high on relevance to SMEs

Association projects generally make a good case as to why the projects were pertinent to the needs and priorities of SMEs. Overall association projects studied are considered to be highly relevant to SMEs' needs and priorities.
Often it is the associations' role to make sure that projects are relevant to SMEs' needs and priorities, communicating their members' needs in the project proposal phase and in the initial phase of the project when it is being put on track.

Figure 5.7 below confirms that compared with other evaluation criteria, relevance scores highest for association projects with some 75% of assessments being either high or very high. Figure 5.7 shows the impact of association projects, amongst which the relevance is rated.

Stakeholder interviews point at several aspects of the Research for SMEs scheme that may affect the link between objectives and need of SMEs (proper target group)

The Interim Evaluation shows that the scheme is delivering the kinds of outputs of relevance to the innovation ambitions of participating SMEs, and in this rather narrow sense it is an effective programme.
However in the stakeholder interviews - that were rather positive - also a number of difficulties with the scheme were identified which call for actions to improve the design to improve its effectiveness:

- A substantial proportion of participating SMEs are research active when they submit their applications, preferring the Research for SMEs scheme to the Cooperation Programme. This group of highly skilled SMEs is arguably reducing the number of target (non-research active) SMEs the scheme can engage with, given a fixed budget.

[112] See the description of Research for the benefit of SMEs in "FP7 Tomorrow's answers start today - Fp7 in a nutshell", page 22.
[113] See Text box 3 in Annex 5, Volume II for some illustrations of expectations and experiences of SMEs participating in FP7 for the first time.

- The Research for SMEs scheme's portfolio is shaped to a greater degree by the participating RTOs than it is by the SME community, for which it was designed. This is not wrong in any fundamental sense, however it may imply that some SMEs and some ideas will be crowded out by the very much more experienced and resourceful RTOs and their agenda.
- The Research for SME associations scheme is widely regarded as a powerful idea that has struggled to succeed on the ground. Club research has the potential to transform general practice across whole industries, through peer learning and active promulgation / diffusion of new knowledge or tools. The great majority of associations has a small core staff and very little capacity or experience to specify or oversee transnational research projects[114]. They struggle to articulate sector-wide challenges or provide robust project leadership and some interviewees report that as a result this class of FP7 projects has experienced proportionately more failures than any other priority area.[115]

Relevance to SMEs might be lower when projects are driven by RTOs…

There are, of course, some projects whose relevance to SMEs' needs and priorities was low, and typically such projects were driven by RTOs. Moreover, there is a danger that RTO initiated projects suffer from insufficient knowledge of the market.[116]

…but this can be tackled by close cooperation with associations

Having said that, projects initiated by RTOs are not necessarily less relevant to the needs and priorities of SMEs, especially if RTOs work closely with associations.
A case in point[117] is a project initiated and developed by a Spanish RTO in cooperation with a Finnish association and a Finnish RTO. In sum, 'hand in hand' collaboration between the association and the RTO performer, both in the project proposal phase and in the project phase, fosters relevance of the project.

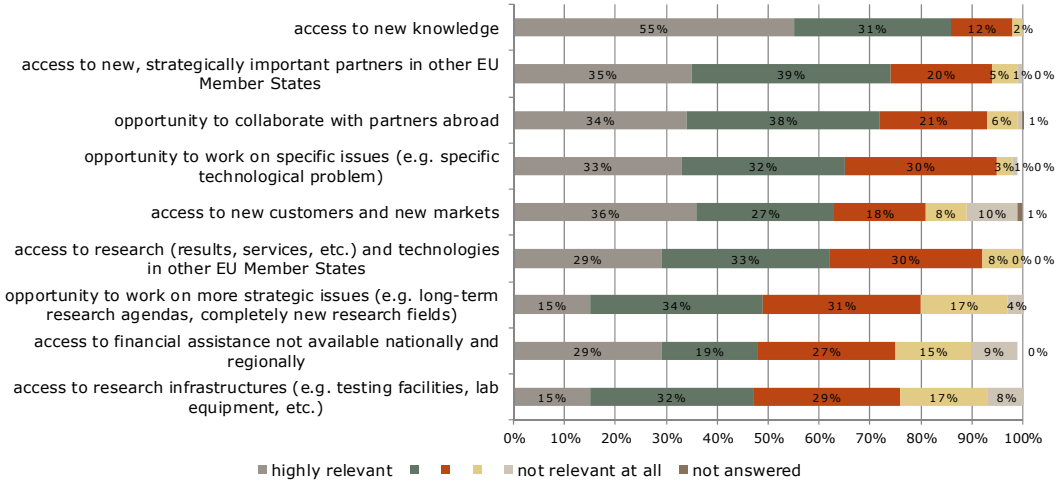
5.1.2 Motivation to join, awareness of objectives and communications

SMEs' needs on access to international knowledge and financial budgets are covered by the Research for SMEs scheme

In line with the objectives of the Research for SME scheme, Figure 5.1 shows that "access to knowledge" is the most relevant reason to join stated by the SMEs in the interviews: 86% (highly) relevant.
This motivation is followed by cooperation issues such as access to partners abroad and more specifically strategically important partners in other EU Member States. Having the opportunity to work on specific issues, e.g. a specific technological problem is still (highly) relevant for 65% of the SMEs.
Opportunity to work on strategic issues, e.g. completely new research fields is (highly) relevant for a smaller share of the participating SMEs (49%). Among the "access to"-reasons it was obviously more relevant for the participating SMEs interviewed to have access to "research and technologies in other EU Member States" and to have "access to new customers and new markets" than having "access to research infrastructures".
"Access to funding/financial assistance not available at national or regional level" is stated to be (highly) relevant for 48% of the SMEs interviewed.

[114] Confirmed by case studies.
[115] This does not show in SME interviews or case studies done in this Interim Evaluation as only completed projects were studies.
[116] Text box 1 in Annex 4 on association cases in Volume II provides two examples of projects with low relevance.
[117] See showcase OPTIMALT in Annex 6 in Volume II.

Figure 5.1 Motivations for participation (Research for SMEs)



Source: Austrian Institute for SME Research 2013 (SME interviews with 150 SMEs; weighted sample).

Motivations of SMEs to join differ by country group

When looking at the different country groups defined by gross domestic expenditure on R&D (GovERD per inhabitant), it becomes evident that within the Research for SMEs scheme the set of motivations differs in relevance:

- access to funding, partners, knowledge is almost equally important among all country groups;
- access to research is more important for SMEs from countries with lower GovERD while access to research infrastructure is significantly more important for those from countries with a higher GovERD;
- SMEs from countries with the lowest availability of GovERD rank the access to new markets and customers higher.

SMEs are very well informed on the objectives of scheme

Asked about the objectives of the scheme, the answers of the SMEs in the Research for SMEs scheme[118] result in the "word cloud[119]" as presented in Figure 5.2.

Figure 5.2 Programme objectives named by SMEs interviewed (Research for SMEs)

Correct responses in relation to each other (counts), clustered answers boiled down to their core meaning.
Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

[118] 150 interviews with SMEs participating in the Research for SME scheme. See Annex 3 in Volume II for detailed results.

[119] A diagram that gives greater prominence to concepts that appear more frequently in the answers of the SMEs.

SMEs relate the Research for SMEs scheme relatively often to knowledge transfer and market orientation

Research for SMEs puts an emphasis on the transfer of knowledge via the buyer-customer relationship between SMEs and RTD performers (such as other SMEs, RTOs or universities). Consequently, the aspect of knowledge transfer was mentioned among the perceived objectives more often compared to the Cooperation Programme. Furthermore, all market-oriented objectives rank slightly higher, which reflects the different nature of the scheme.
Also from the case studies it appears that SMEs that participate in Research for SMEs are far more often motivated by the objective of accessing new markets: in 19 of 47 cases (40%) this seemed highly important, only in 2 cases this was perceived as not important.

Clear and simple communication to SMEs by multiple channels

The RSME initiative is designed for SMEs and its communications reflect that, with simple messages delivered through multiple information channels and media and all backed up by widely available advice through the National Contact Points or NCP network and the Enterprise Europe Network of DG Enterprise and Industry. Each scheme is described clearly in a 10-page brochure (e.g. Research for SMEs: at a glance), which quickly move from a simple description of the objectives to the key facts about the type of support on offer and for what kinds of actions. The brochures explain eligibility clearly and include a number of worked examples for different project partnership scenarios. The communication efforts of the NCP network, and other support structures, are complemented by the unpaid promotional activities of large numbers of experienced European RTOs that draw financial benefit from the programme.

5.2 Effectiveness

Effectiveness concerns the extent to which objectives set for the programme (components) are indeed achieved. The evaluation questions in this area are:
Q4. What are SMEs' roles in the projects? Are there differences between the two dedicated SME schemes?
Q5. What are the outputs of the initiative?
Q6. To what extent has the initiative's output contributed to achieving its specific objectives and general objectives?

Findings on effectiveness of the RSME initiative

1. In the period 2007-February 2013, in total 771 projects started. 62% of all participations in the RSME schemes are SMEs. These SMEs receive 88% of the funds available. It should however be noted that this money is subsequently mostly spent on research done by RTOs; in line with the design of the schemes.
2. Over 80% of the SMEs participate in only one project, nearly 17% in 2 to 5 projects and less than 1% in 6 or more projects in the Research for the benefit of SMEs initiative.
3. In 66% of all the RSME projects an SME fulfils the role of a coordinator. Of all SME participations nearly 12% are done in the role of coordinator.
4. Almost two thirds of the SMEs participating in the Research for benefit of SMEs projects were not included in the initiation of the project. Some SMEs were invited by RTOs to participate and to take a specific role, sometimes just to qualify for the criteria set by the programme.
5. The RSME schemes are well conceived and delivering valuable additional support to innovative SMEs.
6. Gaining access to/producing new knowledge and know-how were achieved by a large majority of SMEs. These intangible outcomes are important as they are instrumental in reaching tangible outcomes. Solving a more concrete technological problem is less common as an effect at this stage. Intellectual Property Rights (IPR) was created by a minority of participating SMEs.
7. Nearly 80% of the SMEs participating in the Research for SMEs scheme state that their participation improved their ability to utilise external know-how and research infrastructure, one of the specific objectives of this scheme.

Findings on effectiveness of the Association projects only

8. In half of the association projects studied, the SME association acted as project coordinator. Practically all SME associations play an important role in the dissemination of project results.
9. With regard to outputs of the Research for SME associations projects it could be noted that projects typically produce demonstrators, prototypes or tools. However, quite often these outputs do not reach the market.
10. SMEs have produced a large number of intangible outcomes in the framework of association projects. These mostly refer to the building up of networks and increases in knowledge that both benefit the SMEs. Often, these two outcomes go hand in hand because SMEs learn from other partners in the consortium, whether other SMEs or RTOs.

5.2.1 Total number of projects and SME participation

In Research for the benefit of SMEs schemes 771 projects started

In total in Research for the benefit of SMEs 771 projects have been started up to February 2013, with an EC budget of 0.9 billion euro. In 2007 only one project started. In 2008 and 2009 more than hundred projects started each year, increasing to 184 projects that started in 2012.

Table 5.1 Frequency of Research for the benefit of SMEs projects, by project start year and by project end year

Project start year	Project end year											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
2007	1	0	0	0	0	0	0	0	0	0	0	1
2008	0	1	50	55	8	0	0	0	0	0	0	114
2009	0	0	2	82	23	2	0	0	0	0	0	109
2010	0	0	0	8	86	48	0	0	0	0	0	142
2011	0	0	0	0	27	126	28	1	0	0	0	182
2012	0	0	0	0	0	13	146	25	0	0	0	184
2013	0	0	0	0	0	0	25	12	2	0	0	39
Total	1	1	52	145	144	189	199	38	2	0	0	771

Source: Panteia 2013, based on eCORDA March 2013.

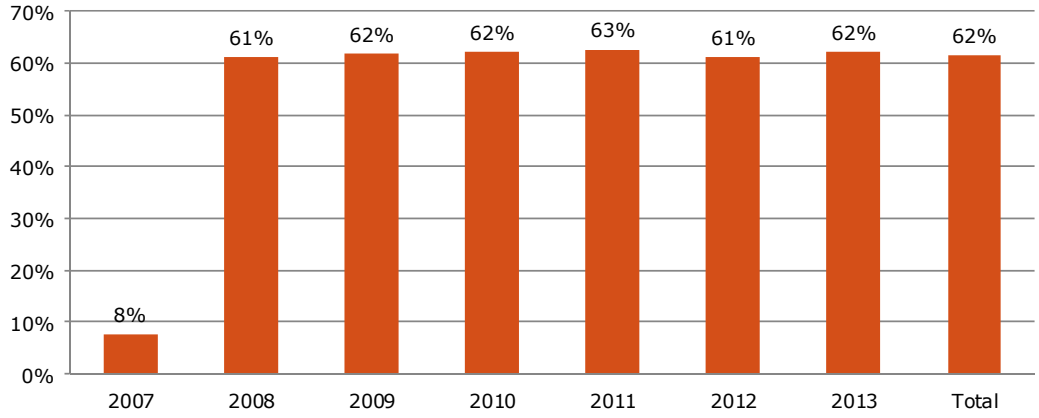
Table 5.1 presents how many projects started and ended each year. For example, from the 114 projects that were started in 2008, 1 was finished in 2009, 50 projects ended in 2010, 55 projects finished in 2011, and finally 8 of the projects reached their end in 2012.
The number of projects that started up in the Research for the benefit of SME schemes from 2007 up to February 2013 is considerable smaller than the high numbers in the Cooperation Programme.

Of all participants 62% are SMEs

In the projects in Research for the benefit of SMEs that started in the period 2007-February 2013, in total 6 947 participants (not unique) have been active amongst which 4 276 SMEs (not unique). This amounts to a participation share of SMEs of 62%.

Figure 5.3 gives a picture of the SME-share amongst the participants over the period 2007-February 2013. Apart from the starting year of FP7 in which only one Research for the benefit of SMEs project started, the participation share of SMEs is quite constant between 61 and 63%.

Figure 5.3 Research for the benefit of SMEs: share of SME-participants in projects started in each year, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

Over 80% of the SMEs concerned participate only once in RSME

In the Research for the benefit of SMEs initiative most participants took part once during the period 2007-February 2013. See Table 5.2 for the frequencies. Also, many parties participated between two to five times in the initiative during this period; amongst all participants as well as amongst the SME-participants. The three most frequent users amongst the SMEs were participating between 26-50 times with the top user taking part 44 times. Amongst all users, ten participants took part more than 25 times, with the most frequent user participating 111 times in the period 2007-February 2013.

So the majority - more than 80% - of the SME-participants took part only once in Research for the benefit of SMEs in the period 2007-February 2013. About one sixth participated 2 to 5 times during this period. Less than 1% of the SMEs participated more than five times in the period considered.

Table 5.2 Frequency of numbers of participations per participant, amongst all participants and amongst SME-participants, in Research for the benefit of SMEs schemes, 2007-February 2013, in numbers and percentages

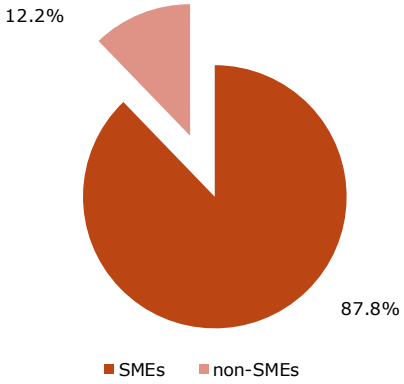
Number of participations	*All participants*		*SME-participants*	
	number	*%*	*number*	*%*
1 time	3603	79.7%	2651	82.5%
2 to 5 times	825	18.3%	537	16.7%
6 to 10 times	60	1.3%	15	0.5%
11 to 25 times	22	0.5%	6	0.2%
26 to 50 times	8	0.2%	3	0.1%
51 to 100 times	1	0.02%		
101 to 200 times	1	0.02%		
	Max. = 111 times		Max. = 44 times	

Source: Panteia 2013 based on eCORDA March 2013.

88% of the budget of RSME was allocated to SMEs

In Research for the benefit of SMEs over the period 2007- February 2013 in total 88% of the budget was allocated for the purpose of SMEs (see Figure 5.4, mostly to be spent on R&D performed by research organisations and universities.

Figure 5.4 Share of the budget of Research for the benefit of SMEs going to SMEs and non-SMEs, 2007-February 2013, in percentages

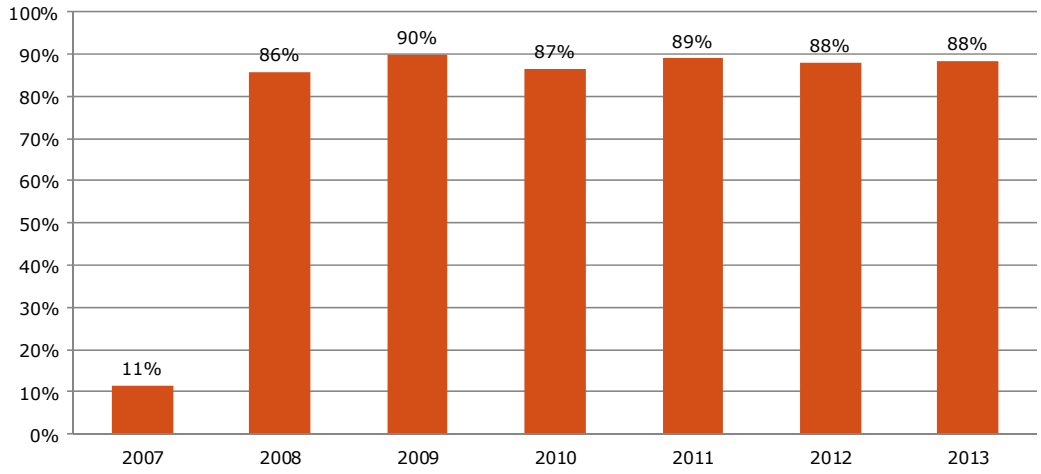


Source: Panteia 2013, based on eCORDA March 2013.

Budget share allocated to SMEs is very stable over time

Figure 5.5 shows that the share of the budget allocated to SMEs is very stable over time: there appears to be not much variation in this percentage over the different years in which the projects started. Only the first year is an exception in this time series because in 2007 only one project started.

Figure 5.5 Research for the benefit of SMEs: Percentage of total EC contribution to SME-participants in projects started in each year, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

On average the success rate to get the application approved is 18%

Analysis of the eCORDA datasets show that of all parties[120] participating in one or more applications for the Research for the benefit of SMEs schemes 18% have been successful in getting the application approved.

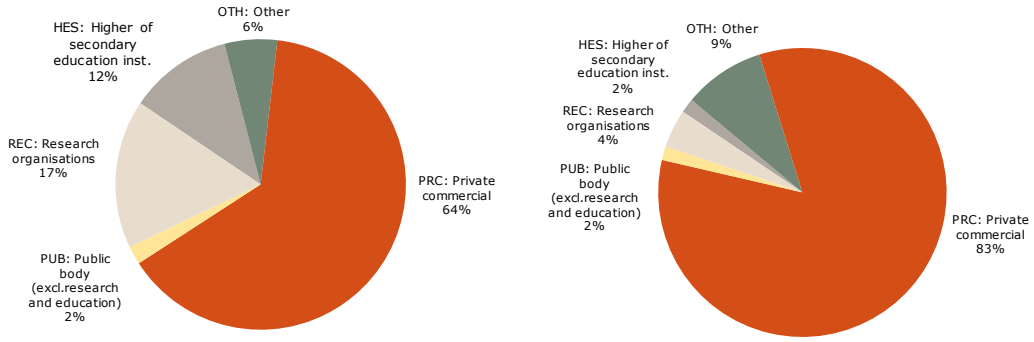
Classifying applicants by NACE sector of activity (if available), it shows that in most sectors the success rate is between 10 - 20%. Most applicants are active in (1) Manufacturing, (2) Real estate, renting and business activities (incl. ICT research and services), and (3) Other community, social and personal service activities, sectors with a success rate for applicants of 14-16%.[121]

5.2.2 Characteristics of participants

Largest group of participants are private commercial organisations

By far the largest group of participants in Research for the benefit of SMEs are private commercial organisations: they comprise 63% of the number of participants with 83% of the budget allocation. See Figure 5.6.
There appear to be two groups of participants that account for much less part of the financial budget than when measured in numbers of participants: research organisations (4% compared to 17%) and higher or secondary education institutes (2% compared to 12%). It should be realised however that money allocated to private commercial organisations is to a large extent spent on research carried out by these latter two categories.

Figure 5.6 Distribution of number of participants (left) and financial budget (right) in Research for the benefit of SMEs, by type of participant, 2007-February 2013, in percentages



Source: Panteia 2013, based on eCORDA March 2013.

5.2.3 Role of SMEs within RSME projects

66% of the projects is coordinated by an SME

Organisations can play - according to eCORDA - two formal types of roles in the FP7 projects: either as coordinator or as participant. In 66% of the projects in Research for the benefit of SMEs an SME fulfils the role of coordinator.[122] As percentage of the in total 4 276 SME participations 12% are in the role of coordinator.

[120] As applicants are not classified as being an SME or not, success rates can only be calculated for all parties applying, not specially for SMEs.
[121] In Annex 1 of Volume II more details on success rates are presented, i.e. by sector in Figure 2.14 and by country group in Figure 2.15.
[122] Most SMEs participating are private commercial organisations, but also among research organisations and other organisations there are SMEs.

Interviews with SMEs show that SMEs perform a variety of activities

In the interviews the SMEs involved performed the following main activities within the project (more answers possible):

- 61% took part in technological development;
- 48% carried out testing and validation activities;
- 43% participated in the research itself;
- 43% developed demonstrators;
- 38% provided training and cooperated with dissemination of results;
- 27% participated in project management and coordination;
- 21% were active in scaling-up the outputs developed in the project.

The respondents described their role with regard to the developed technology in the Research for the benefit of SME schemes:

- 48% of the SMEs described themselves as technology user;
- 46% contributed by defining a research or market need;
- 44% were technology integrator;
- 43% provided the technology basis;
- 32% provided the technical infrastructure.

Most SMEs are active in technology development and validation, in line with the programme design and objectives

In Research for SMEs, the SMEs are most active in technology development and technology validation, which meets our expectations and is in line with the programme design and objectives. However, this result could be affected by the fact that enterprises participating in the Research for SMEs scheme are often "forced" into certain activities and roles to meet the funding conditions, i.e. SMEs had to outsource research (to the formal RTD performers) even though they would have been able to conduct the research themselves, which limited their activity to e.g. validation or up-scaling.

There are almost equally large shares of SMEs acting as technology users, need-defining entities, technology integrators and technology basis providers (between 43% and 48%). Providing research infrastructure was less often the role of the SMEs interviewed. It might indicate that there are only a few SMEs acting "only" as end-users and therefore less than the design of the scheme would imply.

When looking at combinations of roles there are no clearly separated sub-samples (e.g. companies that are "only" end-users) but it is evident that the strongest link can be found between the roles of defining the needs and being the end-users followed by definer and technology integrator. The weakest links to all other roles is to be found for the technology infrastructure providers, which might indicate that these are primarily RTD performers (despite their SME status). SMEs that participated only in Research for SMEs had very often the role of an end-user in the project and less-often the role of research- or market-need definition and also less often the role of a provider of a technology basis.

SME interviews: SMEs are not so much at the driver's seat

Almost two thirds of the SMEs interviewed from the Research for SMEs projects stated that they were not included in the initiation of the project. Only 12% claimed they initiated the project themselves and another 23% were at least part of a joint decision making process. These results seem unexpectedly low with the scheme trying to put the SMEs into the driver's seat, which - at least for those SMEs interviewed - seems to be the exception rather than the rule.

Case studies Research for SMEs: SME involvement is more likely when being project coordinator

In the Research for SMEs scheme, two thirds of projects were coordinated by SMEs. Indeed, this scheme provides higher incentives for SMEs to take this role than in the Cooperation Programme. Within selected case studies the role of the official coordinator of a project, was held by 8 SMEs out of 47, as the case studies covered both coordinating and participating SMEs in these projects. This leads to important observations concerning the role of SMEs in the project. A striking result - given the design of the scheme - is the comparably low assessment of SMEs involvement in the design of Research for SMEs projects if they are not coordinators:

- In the 8 cases where SMEs were coordinators, the assessment of their involvement in project design was very high for 7 cases with only one exception, that case is only assessed as "medium involvement".
- For other SMEs the situation was considerably different: nearly half of the assessments stated that the SME's involvement has been very low (12 cases) or low (6 cases) compared to only 4 cases where it has been very high and 5 where it has been high. In 11 cases, it has been assessed as medium.

SMEs subcontracting RTOs ideally allow SMEs to define their needs…

In RSME, SMEs receive money to subcontract research to RTOs. This should ideally allow them to define research projects where they don't have the necessary in house capacity. Research and development activities undertaken by the SMEs themselves with their own resources are essentially focussed on initial specifications and, later, on validation and testing of the acquired knowledge.[123]

Interestingly, the opportunity to outsource R&D activities can also be perceived as a loss, as SMEs feel that they have to give away funds they would prefer to keep in house.[124]

…however, if the RTO took the initiative this is often not the case

There is no simple rule to this problem, as even within a group of cases, where RTOs took the initiative for an RSME project, and contacted SMEs that have not been in their closest circle of collaboration partners before, some SMEs had surprisingly high benefit and the project led to behavioural additionality perfectly corresponding with programme goals.[125] Probably, these SMEs would not have been in the position to initiate a project. However, such cases are a minority within RSME. Rather often, SMEs complain that they can not efficiently impose their needs and requirements on RTOs, who finally dominate the research project.

If an innovative SME took the initiative the design of RSME is optimal

The picture is different with RSME projects that are initiated and dominated by strong and innovation based SMEs. For them, the programme design is optimal, and most efficient, as they can perfectly tailor their demand and can easily access knowledge provided by RTOs.

Based on their former experience in R&D - as discussed earlier, many SMEs are university spin-offs - they often have realistic expectations of the RTOs contribution. These correct expectations tend to considerably increase the efficiency of the RSMEs programme design. The case study report shows examples of SMEs in the role of coordinator of a Research for SMEs project and illustrates that the "customer-seller"

[123] See Research for SMEs at a glance, European Commission.

[124] Text boxes 5 and 36 in Annex 5, Volume II give some examples of doubts about the efficiency related to the subcontracting of research in RSME.

[125] See for instance the IDEAS show case study in Annex 6, Volume II.

relationship between these SMEs and RTOs is not evident and needs continuous negotiation.[126]

With regard to the extent to which the projects contributed to achieving the specific and general objectives of the Research for SMEs scheme the following can be noted.

- In Research for SMEs, case study research shows that the mobilisation of potentially innovative firms has succeeded only marginally, whereas the scheme was particularly effective for numerous innovative SMEs that were able to increase their involvement in international research and strategic research with longer time to markets.
- The Research for SMEs scheme is also vulnerable to being captured by RTOs that become major beneficiaries of funding. Cases where RTOs invited SMEs to participate do at first glance not correspond to programme objectives in so far as the Research for SMEs scheme should give a better chance to SMEs to pursue their own innovation goals. At second glance, it still appears that also in these cases, SMEs might considerably benefit and increase their innovativeness further, as they gain in confidence and visibility related to their capacities.

Role of SME associations as originating from 28 association cases

In the association cases attention was not focussed on the role of SMEs but rather on the roles of SMEs associations in the projects.

In association cases half of the associations act formally as project coordinator but sometimes this role is contracted out

In half of the association cases studied, the SME association acted as project coordinator. Project coordination can be a strain for the SME association, which often lacks the human resources and expertise to coordinate an FP project. For this reason, project coordination by the association was in some cases just a front and the project management was de facto carried out by a specialised project management firm. However, if the coordination is outsourced to a specialised service provider, there is a danger of the association losing interest in the project and not fulfilling its proper role in the project.
Sometimes associations are also supported by RTOs in the coordination. This typically works well and seems to be a better solution than delegating the project coordination to a specialised project management firm.[127]

SME associations ensure relevance for their members

As mentioned before, an important role of associations is to ensure that projects are relevant to their members. They do so by communicating members' needs to the consortium, especially in the proposal phase and at the beginning of the project when the project is being put on track. In one instance, for example, a European association drew up an inventory of needs, and these were discussed at the start of the project with the coordinator and another national association.

Almost all SME associations play an important role in the dissemination

Practically all SME associations play an important role in the dissemination of project results. Dissemination is the 'natural' role of SME associations, and often they take the formal lead in the dissemination work package. Dissemination typically includes publications (often available online), both scientific and non-scientific; demonstration sessions; trainings and seminars on findings. The latter, of course, pre-supposes that results from projects are advanced enough to organise trainings and seminars around; as will be seen below, this is often not the case. Associations underlined that

[126] See Text box 7, Annex 5, Volume II.
[127] Text box 4 in Annex 4, Volume II focusses on typical roles of SME associations.

they are well placed to undertake the task of dissemination, in particular the translation of scientific research reports into practical and relevant information accessible to SMEs. Dissemination works particularly well if an association project develops guidelines for use by the SME community.[128]

This translation effort is especially important if SMEs are not research-intensive or not accustomed to cooperating with research organisations. An SME association is in a good position to carry out this role because, on the one hand, by being continually in touch with its members, an SME association knows the needs and priorities of SMEs; on the other hand, most of their employees are graduates and are familiar with research, allowing them to act as intermediaries between SMEs and research.

5.2.4 Different types of outputs of the projects

Tangible and intangible project results: 'foregrounds'

The FP7 monitoring data include statistics on the numbers of reported 'foregrounds'. This is the name used by the Commission to refer to selected types of tangible and intangible project results that occur within the life of a FP7 project and can therefore be recorded in the final contract report and programme monitoring system. This includes information and knowledge, whether or not it can be protected, which is generated within the project. Such results include rights related to copyright, design rights, patent rights, plant variety rights, and similar forms of protection.

Table 5.3 presents an overview of the foregrounds reported in all Project Final Reports (to May 2013) based on the published data set out in Table 39 of the 6th FP7 Monitoring Report. These data do not only relate to SMEs, and so need to be treated with some care. The table shows that the RSME initiative produced 853 foregrounds reported in 215 Final Reports. This means 4 foregrounds per project, whereas the Cooperation Programme produced only 0.8 per project. The table also shows the distribution across the five types of foregrounds:

- commercial exploitation of R&D results;
- general advancement of knowledge;
- exploitation of R&D results via standards;
- exploitation of R&D results through social innovation;
- exploitation of R&D results through EU policies.

Table 5.3 Foregrounds reported in the RSME projects

	Reported foregrounds	Commercial exploitation	General advancement of knowledge	Exploitation via standards	Exploitation through social innovation	Exploitation through EU policies
Numbers	853	389	392	57	13	2
Percentage distribution	100%	46%	46%	7%	2%	0%
RSME	150%	243%	143%	570%	32%	2%

Source: Technopolis Group 2013, computation of data extracted from Table 39 of the 6th FP7 Monitoring Report, European Commission, DG RTD, August 2013.

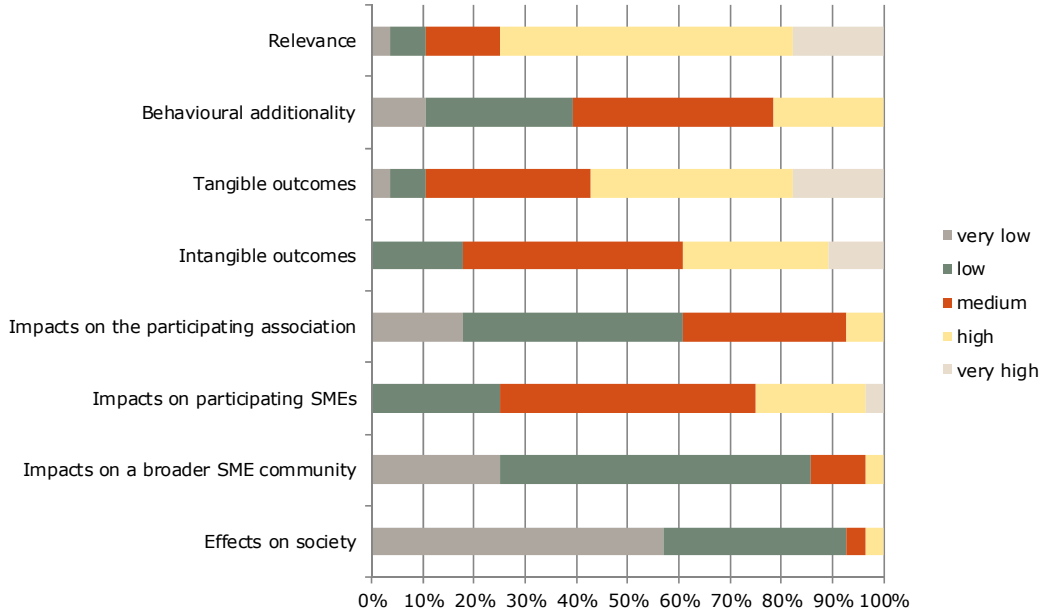
The statistics show that the RSME scheme is delivering both high counts of commercialisation and advances in knowledge. Also exploitation (use) via technical standards is quite commonplace for RSME (more unusual for the Cooperation Programme), on the other hand exploitation (use) through EU policies, is rare for RSME and quite widespread for the Cooperation Programme (as was show in Section 3.2, Table 3.3).

[128] See PROPRALINE showcase in Annex 6 in Volume II.

Projects under the Research for SME associations scheme produce demonstrators, prototypes or tools

With regard to outputs of the Research for SME associations cases the following could be noted. Projects typically produce demonstrators, prototypes or tools. Indeed, in more than 55% of the cases, association projects' tangible outputs were considered high to very high, as shown in Figure 5.7. However, in most cases further development activities are necessary; in only one out of seven cases is a product or prototype being commercialised. More often, nothing much happens after the project comes to an end, to implement project results and bring a product to the market.

Figure 5.7 Impact of association projects (n=28)



Note: Likert scale, with 1=very low, 2=low, 3=medium, 4=high, 5=very high.
Source: Technopolis Group 2013, analysis of 28 case studies in Research for SME associations.

…but mostly further development activities are needed to commercialise

The most frequent barriers to further development activities identified in the case studies are:

- A lack of funding; this barrier is exacerbated if a high investment is required for developing a product to the point where it can be put on the market. In such cases, further technological development activities often depend on the acquisition of investors, as these development activities cannot be executed by the SME end-user group itself, since they lack the capacity to do so. More often, however, consortium members try to find public funding for a follow-up project. In a small minority of cases, a group of actors from the consortium submit a proposal for a follow-up FP project, which they sometimes win. Other consortia consider applying for national funding.
- Intellectual Property Rights (IPR) issues; typically, SMEs will not tackle market implementation until IPR issues are settled. By default, IPR originating from the project belongs to the SME associations, which can cause problems (see below). Having said that, there were also a handful of patent applications in the association cases examined.
- Changed framework conditions; in a number of association cases, a (expected) European Directive acted as an incentive for setting up a project in the Research for SME associations scheme, aiming to help SMEs to conform to European norms

and standards, and to meet regulatory requirements in areas such as health, safety and environmental protection.[129] In one case, however, the European Directive was not passed due to the financial crisis. This in turn stalled the commercialisation of the prototype.

…which is not a natural role for SME associations

There is clear evidence that SME associations are not the right organisations to make further investments to implement the results of an FP project, that is commercialise prototypes, as associations do not have the financial and human resources and expertise necessary for this task. They are not entrepreneurs or investors or technology entities, they are mostly policy making organisations, and it is not their role to invest money to bring a prototype to the market.[130]
This has an impact on the way IPR is handled in association projects.[131] By default, IPR belongs to SME associations but they are not the right organisations to use and exploit it. SMEs, on the contrary, are the ones with the resources to do so, but they must first obtain the property rights from the participating associations, after reaching an agreement. Very often, the person within the association who needs to take the final decision on these results cannot make a final decision on the industrial exploitation of these results because it is not part of his or her other duties (contrary to the situation in individual enterprises). Meanwhile, participating SMEs who might be interested in commercially exploiting these results, cannot do anything. The fact that the final beneficiary of the results of a project is the own industry association is a weakness in the scheme "Research for SME associations" that needs addressing.

Interviews with SMEs show knowledge related effects, i.e. outputs in relation to the objectives[132]

Gaining/producing new knowledge and know-how was achieved by a large majority of SMEs interviewed. Only 12% stated this was not among the effects, which is however still surprising especially since the Research for the benefit of SMEs initiative should supply the SMEs with knowledge that they did not have any access to before. Nearly half of the respondents assign a very high (20%) or high (26%) economic significance to the knowledge gained.

Solving a more concrete technological problem is less common as an effect. 33% did not realise such an effect. This seems quite low as according the idea of the Research for the benefit of SMEs initiative, the projects should have produced exactly that. This might be related to our finding that quite often the initiative for projects in the schemes are initiated by RTD performances and not starting from an identified problem in the production on marketing processes of an SME.

IPR was created by a minority of the respondents: 55% stated that they did not create any IPR and only 16% of all SMEs interviewed (or 36% of those that managed to create IPR) assign a very high (5%) or high (11%) economic significance to this IPR, but still these results are rather high due to the nature of the projects concerned.

The most common effects created through participation in a Research for SMEs project reported by SMEs in the interviews refer to different aspects of knowledge creation. A total of 88% of the interviewees stated that their enterprise managed to gain new knowledge or know-how with almost 50% attaching a high or very high

[129] See for example the CHEMXCHANGE showcase in Annex 6 in Volume II.
[130] Text box 5 in Annex 4, Volume II provides some illustration on this.
[131] See the quotes in Text box 5, Annex 4 in Volume II.
[132] See Sections 6.3 - 6.6 in Annex 3, Volume II for more details.

economic significance to this knowledge. Another 67% resolved a specific technological problem although with a considerably lower level of significance for the enterprise (23% assign a very high or high relevance). The lower frequency of the latter might be linked to the fact that for such a project at least three SMEs had to combine their research interests.
Either way, it seems nevertheless somewhat surprising that 12% and 33% of the respondents have not managed to create such rather "basic" effects as respectively gaining new knowledge and solving a significant technical problem for their enterprise. This could again be linked to having different roles in projects or the aforementioned necessity to merge research interests of more than one company. In this context, it is also of interest to look at IPR as a result of the projects, which - bearing in mind the more applied nature of the research conducted due to the design of the programme - seem to be surprisingly frequent as a result or effect of the projects: 45% of the SMEs stated that they managed to create Intellectual Property (IP) protected through different means of IPR. However, the overall economic significance assigned to these IPR seems to be rather limited.

More than half of SMEs interviewed stated they shortened the time-to-market

Direct commercial outputs and outcomes[133] are among the most prominent effects as can be seen by the comparably high-ranked items of successfully advanced products etc. and implementation of an innovation (76% and 67%, respectively). Both were assessed to - on average - have a high economic significance, which would fit the purpose of the programme of predominantly funding research that directly leads to new products, services or processes marketable within a manageable time-to-market in the in post-project phase. Accordingly, more than half of the interviewees managed to shorten the time-to-market of already developed technologies (with the help of the research results produced being merged with these technologies).

New strategic partnerships realised by three out of four SMEs interviewed

New strategic, i.e. beyond ad-hoc, project-based cooperation, partnerships were realised through the Research for SMEs projects by 74% of the SMEs interviewed with 40% of the respondents assigning a (very) high economic significance to these partnerships.

The two more concrete effects - launching new projects with the partners of the Research for SME scheme and joining research networks - are less common. Respectively 52% (of which 34 percentage points assign a high or very high economic significance to it) and 60% (with 29 percentage points assigning a high or very high economic significance) achieved such effects. The fact that the former exceeds the latter by far concerning the immediate economic significance is not a surprising result at all. Against the backdrop of the target group (SMEs not or not regularly engaged in research to a number of challenges and limitations), it seems to be quite interesting that more than half of the interviewees claimed that their project participation led to follow-up projects. This would almost perfectly mirror the scheme's objective to help those SMEs understand the benefits of research and thus, get involved in respective activities more often or even regularly.

[133] Considering also the results from the case studies 'commercial outputs and outcomes' might sometimes have been understood in the standardised interviews as to refer to prototypes, tools and demonstrators as produced in RSME.

Majority of interviewed SMEs improved ability to use external know-how and research infrastructure

79% of the respondents from the Research for SMEs scheme state that their participation improved their ability to utilise external know-how and research infrastructure, one of the specific objectives of this scheme. However only one third assign a (very) high economic significance to this.
Also the capacity to increase the share of successful innovation projects and increasing their annual expenditures on research and innovation is valid for a majority of the respondents, respectively 71% and 76%. However the percentage that assigns a high or very high economic significance to this is considerably lower, respectively 28% and 23%.
The ability to attract private funds or increase the number of permanent staff for research and innovation tasks is even lower, respectively 45% and 51%. The percentage assigning a high or very high economic significance to this is only 17%, respectively 14%.
SMEs without any prior funding experiences report much lower economic significance regarding capacity effects with the exception of the ability to utilise external know-how and research infrastructure.

SME interviews: around 40% report sales to new customers and new markets in other EU MS

43% report more sales to one or more new customers in other EU Member States and only as little as 9% express a high or very high economic significance associated with this. Making sales to one or more new markets in other EU Member States is only happening for 36% of the respondents, of these as little as 6% assign a high or very high economic significance to this.
Effects such as founding a spin-off company or having a merger with or acquiring a key competitor happen only for 8%, respectively 11% of SMEs, with respectively only 3 and 4 percentage points assigning a high or very high economic significance to this.

The fact that not much time passed since the conclusion of the projects might be responsible for the relatively low score for hard economic effects being a result of the projects funded. While spin-offs and mergers/acquisitions are always a rather rare direct result of research activities (91 and 89% state that this effect did not happen), it is worth mentioning that almost 60% state that there was no increase in sales (yet) as a result of the project and even in the case it was achieved the impact seems to have been limited. At first, this seems to contradict the general notion of effects achieved matching the scheme's objectives to quite some extent. However, it needs to be understood that there might not be an actual contradiction here: technologies developed in applied research, more or less directly transformed into marketable products etc. in the post-project phase might often replace existing technologies sustaining customers and market shares rather than adding new sale opportunities.

In the association cases, intangible outcomes mostly refer to networking and acquiring knowledge

SMEs have produced a large number of intangible outcomes in the framework of association projects. Overall, intangible outcomes were considered to be above medium with almost 40% of case study authors assessing intangible outcomes to be high or very high (See Figure 5.7). The intangible outcomes produced mostly refer to the building up of networks and increases in knowledge that benefit the participating

SMEs. Often, these two outcomes go hand in hand because SMEs learn from other partners in the consortium, whether other SMEs or RTOs.[134]

Instances of knowledge increases also include the building up of know-how in areas in which SMEs had not worked before or 'side' knowledge and findings that can be used in other applications. Knowledge is often codified in the form of publications - scientific and non-scientific. Instances of networking occurred when the association project allowed SMEs to develop links to a particular industry, that is a new market they wanted to enter, or when a project allowed to link innovative SMEs from several countries in an otherwise fragmented industry.
In another instance, project partners had the chance to visit the installations of different participants and this made it easier for SMEs to establish commercial relationships between them, as they got to know each other personally. As a result of the networking between participants, some of them have started to work together in other projects.

5.3 Efficiency

Efficiency concerns the question to which extent the desired effects are achieved at reasonable cost.

The evaluation questions in this area are:
Q7. How economically have the initiative's inputs been converted into outputs (input-output ratio)?
Q8. Have the expected outputs been clearly formulated?

Findings on efficiency of the RSME initiative

1. Only 43% of the SMEs in the Research for SMEs scheme stated in the SME interviews that the benefits right away outweighed the costs, 42% expected this to be realised in future (so together still a large majority) and 14% did not expect the benefits to outweigh the costs at all.
2. Data on 'time-to-grant' show that it takes around 11 months on average from proposal submission to contract signature. This is quite long for a market-oriented scheme. Still, the SMEs participating in the RSME initiative seem to be rather satisfied with the implementation of the schemes. The time-to-payment even ranks first with 56% of the participating SMEs being satisfied (ranking of 10 implementation aspects based on information from the SME interviews). Still 44% are not satisfied and this might be relatively important for SMEs that struggle to get activities financed. Least satisfactory of 10 aspects assessed are the administrative requirements for applications in the view of the respondents.
3. Both SMEs and SME associations report often that networking was one of the most important features of the RSME initiative and that project management was efficient and satisfying.
4. However, there appear to be efficiency concerns in situations where no follow up is possible after the end of the project and products are not yet brought to market. Project benefits then tend to be mainly intangible, and projects might be regarded as rather expensive learning and networking exercises.
5. A point emerging from the case studies that has to be questioned in terms of efficiency is the design of the Research for SMEs scheme, according to which SMEs don't receive money for themselves, but have to use funds to pay RTOs for their research activities. The Research for SMEs scheme seems to benefit the universities and RTOs more than the SMEs. Universities and RTOs frequently just find SMEs to partner up to qualify for the funding but often the SME does benefit relatively little from being involved. This practice, where RTOs are developing project designs and only at a late stage get SMEs on board, is the opposite of the intention of the programme: start with focussing on actual R&D needs of SMEs.

Most stakeholders can not comment on efficiency

As with the Cooperation Programme, the very great majority of stakeholders have a limited and primarily qualitative view of the RSME initiative's output efficiency. Most felt unable to comment, and where people did they tended to take a soft focus applauding the initiative for producing worthwhile outputs that would not be realised otherwise.

[134] Intangible outcomes of association projects are illustrated in Text box 7 in Annex 4, Volume II.

In 2013 less than half of the SMEs state that the benefits outweigh the costs

From the SME interviews it showed that only 43% of the SMEs in the Research for SMEs scheme stated that the benefits right away outweighed the costs, 42% expected this to be realised in future (so together still a large majority) and 14% did not expect the benefits to outweigh the costs at all.

The 43% that stated that benefits already outweigh the cost varies somewhat by the role of the SMEs in the project with regard to technology as shown in Table 5.4. Highest scores are among providers of technology basis and technology infrastructure.

Table 5.4 Percentages of SMEs in the Research for SMEs scheme for which benefits already outweigh costs by role in project regarding technology

Role of SME in project regarding technology					Total
Definition research/ market need	Provider of technology basis	Provider of technology infrastructure	Integrator	User	
46%	52%	51%	40%	43%	43%

Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

On average it takes 11 months from proposal submission to signed contract

Table 5.5 below presents 'time-to-grant' statistics for the RSME initiative and for FP7 overall.[135] Time-to-grant (TTG) is defined as the time elapsed from the deadline for a given call for proposals and the signature of the grant agreement. The data include maxima and minima as well as average TTG data, and show that it takes around 11 months on average from proposal submission to contract signature. This is quite long for a market-oriented scheme.[136]

Table 5.5 Time-to-grant (in days) for FP7 grant agreements (as of May 2013)

		Time to grant		
	Number of grants	Average	Min	Max
RSME	738	375	202	809
Overall FP7	18 573	320	13	1 115

Source: Sixth FP7 Monitoring Report, European Commission, DG RTD.

Interviewed SMEs are rather satisfied with implementation of programme

Additional information on the efficiency of the Research for the benefit of SME schemes is given by the respondents of the SME interviews assessing a range of implementation aspects. The SMEs interviewed seem to be rather satisfied with the implementation of the initiative.

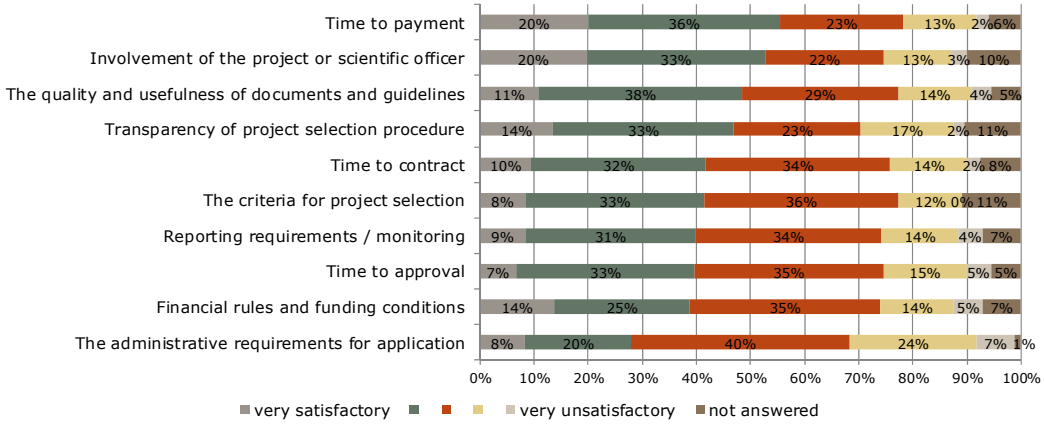
Based on the ranking of the positive ratings (on a 5-point scale), the time-to-payment (which is often seen as being of dominant importance to SMEs with their

[135] The figure is based on statistics for FP7 grant agreements signed in the period 2007 - 2012 (as of May 2013), taken directly from Table 18 (page 42) of the Sixth FP7 Monitoring Report, Monitoring Report 2012, published by the European Commission, Brussels, August 2013.

[136] The average for RSME is some 17% higher than for FP7 as a whole. This is rather moderate difference as Table 3.5 showed that within the Cooperation Programme, some thematic areas have an average that is 30% higher and security even has an average that is 57% higher than the average for FP7 as whole. Still it is rather long compared to national schemes. For example with the CTI programme in Switzerland the time-to-Grant is 6 weeks only (smaller projects, fewer partners).

usually limited own resources) ranks first with 56% of the interviewees being (very) satisfied. Still 44% are not satisfied and this might be relatively important for SMEs that struggle to get activities financed. Time-to-payment is followed by involvement of the Commission in the person of the officers responsible for the project (scientific officer) with 53%. Least satisfactory of 10 aspects assessed (see Figure 5.8) are the administrative requirements for applications in the view of the respondents, respectively 8% and 20%, total 28%. Still the balance is not very negative as only 31% state (very) unsatisfactory.

Figure 5.8 Assessment of implementation aspects by all SMEs interviewed (Research for SMEs)



Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

RSME case studies

The qualitative approach of case studies provides insight in some particular aspects of the efficiency of the two schemes of the RSME initiative: Research for SMEs, and Research for SME associations.

… involved parties are positive about networking and project management

First of all, both SMEs and associations often report that networking was one of the most important features of this initiative, and that project management was efficient and satisfying. This is in line with experiences in the FP7 Cooperation Programme. There is no doubt, that personal meetings and exchange are crucial to achieve these benefits. Often it is helpful if the coordinator has previous experience in FP7, thus knowing how to encourage relations between partners so that they get involved in the project. An experienced project coordinator also knows about the importance of face-to-face meetings between project participants, creating a climate of trust and facilitating communication. This in turn can be conducive to project success and project impact. Still, the efficiency of these meetings varies between projects.[137]

SMEs in case studies worry about the efficiency since tangible results can not be achieved yet

In general SMEs achieve interesting (technical) results in these projects: they develop tools and prototypes, demonstrators or data bases. In some cases, the main tangible outcome is the confirmation of the functioning and competitiveness of a

[137] Text box 3 in Annex 4 and Text box 4 in Annex 5 (Volume II) provide some illustrations of the importance and efficiency of personal meetings.

product or process, in others, it becomes clear that the initial technology that was meant to be used was inappropriate to meet the requirements of the market and a different concept is developed in the consortium. These kinds of outputs are not yet valued economically, but they are key for further developments. However, there appear to be efficiency concerns in situations where no follow up is possible after the end of the project, for example because SMEs lack the financial resources required.[138] Benefits then tend to be mainly intangible and projects might be regarded as rather expensive learning and networking exercises.

Also worries about the design of the Research for SMEs scheme

A point that has to be questioned in terms of efficiency is the design of the Research for SMEs scheme, according to which SMEs don't receive money for themselves, but have to use funds to pay RTOs for their contribution.[139]

SMEs state for example that in many cases in the Research for SMEs scheme, projects are said to benefit the universities and RTOs more than the SMEs. The EU is a potential source of funding and one way to get it is via the Research for SMEs scheme. So universities or RTOs need to find SMEs to partner up with but often the SME does not benefit much from being involved; they are just a way for the universities to get funding. This is believed to be the opposite of the intention of the programme that is to focus on actual R&D needs of the SMEs.

[138] Text box 14 in Annex 5, Volume II shows examples of cases where SMEs lack the financial resources for the post-project phase of Research for SMEs projects.

[139] See also Text boxes 5 and 7, Annex 5, Volume II.

6 Impact of RSME on participating SMEs and society

6.1 Impacts

Impact is a general term used to describe the significant effects of an intervention on its beneficiaries and other affected parties (society). Impacts can be either positive or negative and foreseen or unforeseen. Initial impacts are called results, whilst longer-term impacts are called outcomes.

The evaluation questions in this area are:

Q9. What have the impacts of the initiative been on society and on the participating SMEs?

Q10. How have employment, turnover and profitability (economic effects) of the participating SMEs developed in comparison to the control group?

Findings on impacts of the Research for the benefit of SMEs (RSME) scheme

1. The econometric results - although based on a relatively small number of observations - show that SME participants in RSME initiative had higher employment growth in the period 2006-2011 than the SMEs in the control group.
2. From the interviews with SMEs in the RSME it followed that asked about the impacts of the FP7 project, respondents rate increases in competitiveness rather high, followed by increases in productivity and profitability. Impacts on turnover and employment are rated lower. Those expecting an impact - just above 20% - were asked about the size of this. Results on turnover, employment and exports for this sub-group are estimated to be about +16%.
3. Asked about important long-lasting effects, the SMEs in the interview most often mention: a) Increased, deepened or new collaborations with partners, b) Increase in innovation-related competences and capacities, c) Commercialisation and d) Knowledge.
4. For almost 60% of association cases the impact of association projects on society is considered to be low or very low. This often means that so far there are hardly any impacts on society visible. Expected impacts on society are often of an environmental nature.
5. There is an impact on commercial success of participating SMEs in almost a third of the association cases. However, in many cases the impact is limited to a subset of participating SMEs and most of the time the impact cannot be quantified in terms of employment, turnover, and profitability.

6.1.1 Quantitative impacts on economic performance indicators

Econometric analyses are used to compare economic performance of treatment with control group

One of the key issues in evaluating impacts of any intervention or programme, such as FP7, is obtaining a credible estimate of the counterfactual: what would have happened to participants if they had not participated. In other words, there is need to construct a control group that has ex-ante the same probability of participating in FP7. Therefore, we need two comparable groups of SMEs:

- SMEs that have participated in FP7, the treatment group;
- SMEs that did not participate in FP7, the control group.

Both groups have to be compared before FP7 started, preferably in 2006. Then both groups have to be followed in time on several performance indicators. The more similar and comparable the treatment and control groups are in terms of various characteristics, the more likely it is that any observed difference on the performance indicators can be assigned to the use of FP7.

Below more technical details are provided, the reader who has read this already in section 4.1 for the Cooperation Programme, might go directly to the empirical results of the econometric analysis.

Propensity Score Matching is applied to set up the control group of SMEs

The control group of SMEs is constructed using Propensity Score Matching. This method estimates propensity scores on the basis of a set of observed characteristics for both SMEs receiving support from FP7 and non-supported SMEs. In order to ensure comparability the estimated propensity scores of SMEs participating in FP7 and the control group should be very similar.
The basic idea of Propensity Score Matching is to select from a large group of non-participating SMEs, SMEs that are 'most similar' to the participants in all relevant pre-treatment characteristics. That being done, differences in outcomes between this well selected and thus adequate control group and the participants group can be attributed to the programme.[140]

Difference-in-Difference method is applied to consider the differences in developments over time

The Difference-in-Difference method is a technique that can be applied to compare the development over time of different groups of SMEs: it compares the SMEs participating in FP7 with the control group on several performance indicators to quantify the impact of FP7. The simplest set up of this method is one where outcomes are observed for two groups for two time periods. One of the groups is exposed to a treatment in the second period but not in the first period. The second group, the control group, is not exposed to the treatment during either period.

Two following two differences are calculated:

- The first difference measures the change in the impact indicator before and after the FP7 programme for both the participant SMEs (treatment group) and non-participant SMEs (control group).
- The second difference measures the difference in the rate of change in the impact indicators between the participant SMEs (treatment group) and the non-participant SMEs (control group).

In other words, when the same numbers of similar SMEs within the treatment and within the control group are observed in each time period, the average gain in the control group of SMEs is subtracted from the average gain of the SMEs in the participants group. The difference can be attributed to the use of FP7. The main assumption of the Difference-in-Difference approach is that the development of the performance indicators - i.e. apart from participation in FP7 - would be the same for participant SMEs and the control group SMEs.

Two datasets are used to set up the treatment and control group

In order to be able to compare SMEs in the treatment group with similar SMEs in the control group individual, company-level data was needed. Therefore two datasets are matched on company-level: eCORDA from the European Commission and ORBIS from Bureau van Dijk:

- eCORDA (External Common Research DAta Warehouse) is a database from the European Commission that contains data on applicants/proposals and signed grants/beneficiaries with regard to a specific Framework Programme for Research. On 7 March 2013 the Consortium received the datasets from DG RTD of the

[140] See Annex 1 of Volume II for more details.

European Commission. The datasets include information on FP7 Grant Agreements and Participants and FP7 Concluded calls for proposals and its applicants from 2007 up to 26 February 2013.

- ORBIS contains information on innovation and business performance of the FP7-participants that is not available in eCORDA. Therefore ORBIS of Bureau van Dijk, an extensive database on millions of enterprises in Europe and beyond, primarily consisting of financial data, was used to supplement business information on eCORDA. ORBIS provides also business information on enterprises not included in eCORDA that are used to construct a control group.

Treatment group: unique SMEs in finished projects in 2008-2010

Taking into account the time lag between participation and impacts of FP7, and the latest year available of the performance indicators needed[141], the focus is on the projects that were finished in the period 2008-2010. In order to construct a proper control group we had to look at the situation before FP7 started. So furthermore, only those unique SMEs were selected for which financial performance data for 2006 is available.

In total, 507 participating SMEs meet these requirements. These 507 SMEs are candidates for the treatment group (this number includes the Cooperation Programme as well as the Research for the benefit of SMEs initiative). However, some financial performance indicators are much better covered in the matched database of eCORDA and ORBIS than others. Because of the missing data the number of SMEs in the final treatment group is smaller. The final size of the treatment group of unique SMEs depends on which combination of indicators is included in the propensity score models.[142]

Several characteristics of SMEs are used to construct the control group

Several characteristics of the SMEs, i.e. country of origin, sector, age, size in terms of employment and property structure are used to match SMEs by applying the Propensity Score Matching method.[143] An SME in the treatment group (participant in FP7) is matched with an SME to be included in the control group that has - based on its characteristics - a similar chance to participate in FP7. In this Interim Evaluation, in the Propensity Score Matching, one-to-one nearest neighbour matching was used, in order to compare the treatment group (SMEs participating in FP7) with the control group.[144]

The one-to-one nearest neighbour matching chooses an SME from the candidate control group that is a matching partner for an SME participating in FP7 that is closest in terms of the propensity score.

[141] Looking at the whole sample of enterprises included in ORBIS, for about 13% of the matched organisations the latest year of performance data available is 2012, for 72% 2011 performance data is available and for 8% the latest year available is 2010. For the other part (7%) only 2009 data or (much) earlier years are available. Because of the time period needed between the intervention and the performance measurement due to time lags, 7% is not suitable for the impact measurement. For the other part (93%) 2010, 2011 and/or 2012 performance data are available.

[142] See Annex 1 of Volume II for more details.

[143] However, next to these characteristics that are used, the chance to participate and performance might also be affected by other characteristics such as ambition to growth, level of innovation and export. Due to data limitations, these latter variables could not be used in constructing the control group. See Annex 1 of Volume II for more details.

[144] See Annex 1 of Volume II for more details.

The developments of three economic performance indicators are considered

In this Interim Evaluation we considered three economic performance indicators: number of employees (employment), operating revenue (turnover) and profit margin (profitability).
To be more precise:

- Employment growth.
- Growth in operating revenue.
- Growth of the profit margin.

For each indicator performance results are measured as changes in growth rates comparing 2006 (the year before the start of FP7) and the most recent year available. The empirical results of the econometric analyses, using Propensity Score Matching (PSM) combined with the Difference-in-Difference method, show that for Research for the benefit of SMEs there are statistically significant differences in the employment growth between the treatment group and the control group in favour of the treatment group, implying that these positive effects might be attributed to the use of FP7. The results on the growth in operating revenue and profit margin present no statistically significant results. The performance differences regarding employment between the treatment and the control group are described in more detail below.

For results on SMEs participating in RSME presented here it should however be noted that one should be careful with interpretation of the results obtained because of the small number of observations remaining after several steps[145].

Employment growth rate of SMEs in RSME higher than growth rate of control group

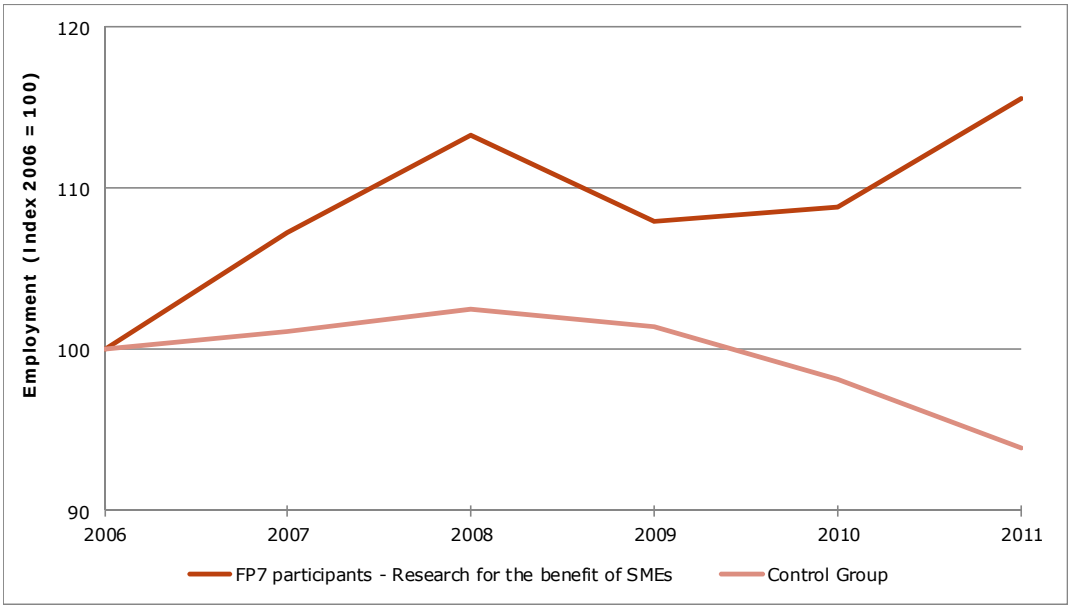
In Figure 6.1 the index of employment[146] of SMEs participating in the Research for the benefit of SMEs initiative is compared to similar non-participating SMEs: the control group constructed by applying PSM.

The index of employment of SMEs participating in FP7 in 2011 is significantly higher than those of the control group in 2011, i.e. four years after the start of FP7. SMEs participating in RSME have grown on average 14% over the period 2006-2011. In the same period, for the control group employment decreased with 3%. Hence the difference between the SMEs participants in Research for the benefit of SMEs and the SMEs in the control group in employment growth between 2006 and 2011 is about 17 percentage points.

[145] Annex 1, Volume II shows that initially there were 209 SMEs which participated only in RSME projects that finished in 2008-2010 and for which performance data is available from ORBIS. However after applying PSM, the number of observations was reduced with almost 60%. The results presented here are based on a low number of matched participants (93 SMEs), therefore the results are only indicative and might not be representative for the entire population.

[146] Based on 5% trimmed mean. This is the mean if the lower and upper 5% of values are deleted. So, extreme values are excluded both from the treatment and the control group.

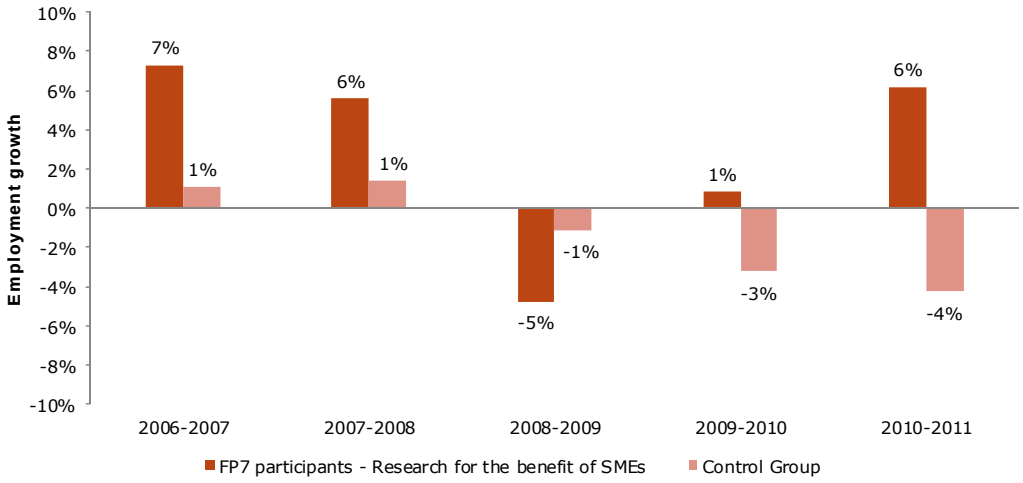
Figure 6.1 Index of employment of SMEs participating in the FP7 Research for the benefit of SMEs initiative compared to matched non-participants (control group) (Index 2006 = 100)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

In Figure 6.2 the annual growth rates of participants in RSME and the non-participating SMEs are depicted. Between 2006 (before FP7 started) and 2007 (the year FP7 started) participating SMEs show an employment growth rate of about 7% whereas the control group grew 1% in employment. First the annual growth rate among the participants was positive, but in the period 2008-2009 employment decreased more for the treatment group than for the control group. In 2009-2010 there was again a slight positive growth. In the period 2008-2009 and beyond the control group showed a decrease in employment.

Figure 6.2 Annual employment growth of SMEs participating in the FP7 Research for the benefit of SMEs compared to matched non-participants (control group)



Source: Panteia, calculations based on eCORDA and ORBIS using PSM to construct control group.

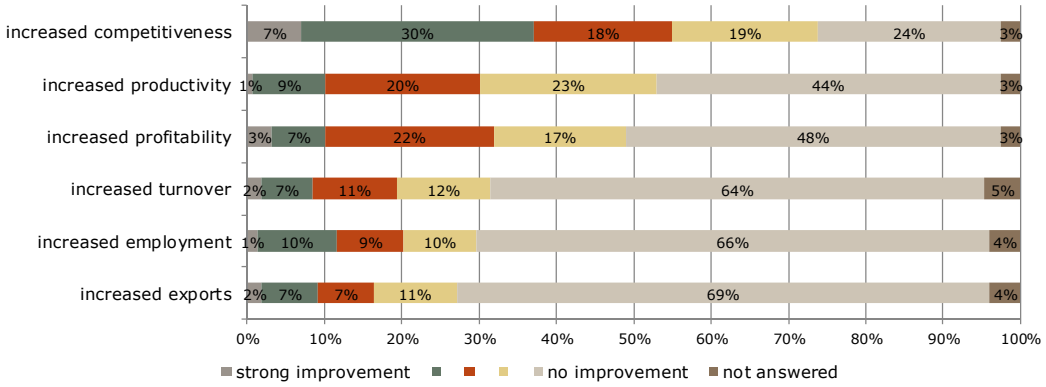
FP6: higher employment growth rates of participating SMEs than non-participants

As discussed in Section 1.5, the time horizon is probably too short to look into impacts of RSME. Also for RSME a similar analysis was performed on participants in FP6. If only the FP6 participants are considered that participated in FP6 priorities that are similar to RSME in FP7, then the index of employment is higher for the participating SMEs than within the control group. In addition the annual growth rates are, with the exception of the rate between 2008 and 2009, higher than in the control group.[147] So, longer term effects might be expected.

SME interviews: SMEs report not that high impacts on business performance

In the interviews with SMEs in the Research for SMEs scheme respondents were asked about the impacts of the FP7 project on six different aspects of the business performance. Respondents were asked to answer on a 5 point scale ranging from 1=no improvement at all up to 5=very strong. See Figure 6.3.

Figure 6.3 Impacts of the participation on the economic performance (Research for SMEs)



Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

The list below shows the average score[148] on this scale from 1 to 5:

- competitiveness 2.8
- productivity 2.0
- profitability 2.0
- turnover 1.7
- employment 1.6
- exports 1.6

These results show quite some differences between the various aspects, but all average scores are less than the average of the scale. SMEs participating in the Research for SMEs scheme that did not have any prior funding experiences report lower impacts on their economic performance.

Estimation of about 16% increase in turnover, employment and exports

The findings presented above result from the question *"Did your company's participation in the project result in one of the following improvements of its economic performance?"* For the three aspects turnover, employment and export a

[147] However, the difference between the FP6 participants and similar non-participating SMEs is only marginal significant. 120 SMEs in the FP6 Cooperation programme could be matched to similar non-participating SMEs.

[148] If responses would be equally divided among the 5 classes (each 20%), the average would be 3.

more detailed question followed asking for percentage increase if the answer was positive. In Annex 3 in Volume II more detailed answers are provided, e.g. 24% of the respondents in the Research for SME scheme that provide information on increase of turnover, indicated that their turnover improved by 20-50%. An approximation for the overall averages[149] of these three items is:

- turnover + 15%
- employment + 15%
- exports + 16%

The quantitative analysis of employment growth of participants in the Research for SMEs scheme compared to the control group showed a positive impact: over the period 2006-2011 the employment growth of participants was 17 percentage points higher.

Figure 6.3 shows that a majority of the participating SMEs report an impact on economic characteristics of their enterprise: 74% for competitiveness and for productivity 63%. The score for performance indicators is a bit lower: for profitability 49% see an improvement, for turnover 31%, for employment 30% and for exports 27%. Looking at the quantitative estimates provided, this part of the SME respondents (some 30%) estimate that the increases in these three variables due to their participation is about 15%. These numbers result from the question 'Did your company's participation in the project result in improvements of its economic performance; if yes with how much percent?' There was no specific time period considered. But comparing the average increase in employment estimated by the SMEs (15%, some 5% for the entire group) with the growth over the period 2006-2011 shown in Figure 6.1 resulting from the quantitative analysis (17 percentage point difference between participants and control group), it shows that their perception is relatively low. Part of the difference of 17 percentage points found in the econometric analysis is however already obtained before impacts of FP7 are there (2006-2007) and in addition it is not easy for the respondents to estimate the development of their enterprise would they not have participated in FP7.

6.1.2 Additional information on impacts

Long lasting effects mentioned by interviewed SMEs are predominantly increased / deepened or new cooperation

The respondents of the SME interviews in the Research for SMEs scheme were asked which of the outputs discussed during the interview are especially long-lasting or are expected to create especially long-lasting positive effects. The results are presented as a word cloud in Figure 6.4.

Figure 6.4 Long lasting effects Research for SMEs scheme

Source: Austrian Institute for SME Research 2013 (SME interviews; weighted sample).

[149] Assuming that the average score for the group SMEs indicating a growth of 20-50% is 35%, etc. See Table 21 in Annex 3, Volume II.

The SMEs interviewed predominantly mention as the long-lasting effects:

- Increased/deepened or new collaborations and cooperation with partners as the single most important among the long-lasting effects. Among the new cooperation opportunities research and business partners seem to be equally important.
- Secondly, the increase in innovation-related competences and capacities are important; both include an improvement in different aspects of the execution and management of research and innovation projects. It has been stated by the interviewees that their project participation often helps them to professionalise their research activities or teaches them how to successfully act in an international consortium of considerable size (considerable in contrast to their usual one-to-one cooperation pattern).
- The development of a marketable product/service and generally, the successful commercialisation/market-oriented exploitation of project results ranks third in this regard, making it another outstandingly long-lasting effect of SMEs' FP participation.Interestingly, this effect is often linked to gaining access to new markets or customers or even opening completely new business areas, which clearly reflects the strong structural effect the participation has on the SMEs, i.e. in many cases the research done does not "simply" mean a continuation of a technology or application already half-way developed. This is closely linked to the development of new technologies or applications for a technology, which is also frequently named a long-lasting impact on the SME.

Surprisingly - given the fact that in theory the Research for SMEs scheme should predominantly support SMEs that for a variety of reasons do not engage in research, at least not frequently - there is much less change in the innovation attitudes and behaviour or at least the interviewees consider such improvements as being less prominent in terms of the long-lasting effects created. A potential explanation could be that either the SMEs involved were not actually new to research or the relevance of improved capacities tends to overshadow the less "measurable" effects regarding the behavioural aspects.

New jobs are not mentioned much by the SMEs interviewed

Against the backdrop that market-related effects are quite prominent and an increase in the SMEs' overall economic and innovation-related competitiveness is also of some importance it seems striking that new jobs are ranked very low among the long-lasting effects. However, certain effects - as for instance job creation - might very well be among long-term effects, which cannot be seen, yet.

Case studies in Research for SMEs distinguish three types of impact: networking, reputation and competitiveness

The case studies on SME participation in the Research for SMEs scheme only include projects that have been finished at the moment of selection, still often the ultimate market implementation of innovations is yet to come. Nonetheless, some impact is already observable at the SME level. As with cases in the Cooperation Programme, two levels of impacts on participating SMEs are distinguished:

- firstly enabling factors increasing the potential of SMEs through networking and cooperation, knowledge and competitiveness;
- secondly economic impacts, i.e. employment, turnover and profitability. The third level of impacts this evaluation is interested in is the impact on society.

These impacts are again organised along three dimensions of impact on SMEs, namely networking, reputation, and competitiveness.

1. Networking is one of the core factors of Community Framework Programmes. Case studies show the variety of effects that result from networking. Networks established under this SME-specific initiative do globally differ in three aspects

from networks under the Cooperation Programme, as firstly, they include more SMEs and secondly SMEs have more often the role of a coordinator and become clients of Research and Technology Organisations (RTOs). Thirdly, in addition to the "usual suspects" of highly innovative and research oriented SMEs, mostly young SMEs, there are more newcomers participating in Research for SMEs. Given these principal particularities, case study research shows that in fact, in many cases, the situation does not differ that much from classical Cooperation projects. The following observations should be highlighted:

- New relationships are typically observed with very young SMEs. A key benefit for SMEs is to access new potential clients or technology users. In Research for SMEs, participants tend to be particularly motivated by this perspective.
- SMEs are dominantly interested in contacts with research organisations or industrial partners. A focus on networking with other SMEs is rather the exception, also in this SME-oriented scheme, but there are of course continuing relationships also between participating SMEs.
- Participating SMEs tend to have close contacts with only a few partner organisations in the particular work-package they are involved in, for instance because these are the RTOs providing research service. In that case, only a few contacts remain active after the end of the project.

2. Reputation can be understood as the opinion about the SME within a wider community than the concrete project partners. SMEs report on positive reputational effects. Compared to Cooperation projects, where SMEs increase reputation due to their technological contribution in the project, in Research for the SMEs, more frequently, SMEs particularly benefit from first experience on the international level, in case they have not cooperated internationally before.
3. Competitiveness is the ability to and performance of a firm selling its products and services in a given and contested market. For companies engaged in innovation, the challenge is not only about reducing costs for a given product or service, but being at the forefront of development. For SMEs participating in Research for SMEs, competitiveness is a key factor of success. Although there are no clear indicators on the increase of competitiveness, case studies shows that overall, increases in competitiveness due to access to relevant technological knowledge and increased internationalisation are reported. However, on a very concrete basis, only a minority of SMEs can clearly name a new client base, or cost reductions. As most of participating SMEs are research and technology oriented, their engagement in RSME is coherent with their position in the market and allows them to maintain their competitiveness. Still, in certain cases, it was clearly stated that the achievements stabilised the competitiveness of an entire industry.[150]

Case studies Research for SMEs reveal hardly any impacts on society

The second evaluation question linked to impacts investigates the impact on society. These are not very much of an issue in the RSME initiative, which is bottom up, therefore calls don't address any societal challenge in particular. Moreover, as with Cooperation, even where technologies might have positive impacts on society, these are not yet observed as the technologies are often not yet implemented. The majority of projects observed in case studies don't care about societal impacts that much: only 3 cases in Research for SMEs projects refer to very high impact on society, further 2 cases to high impact on society, compared to 20 cases with very low and 14 cases with low impact on society.[151]

[150] Some impacts related to increased competitiveness are shown in Text box 21, Annex 5, Volume II.
[151] Potential or long-term effects on society of Research for SMEs projects are shown in Text boxes 23 and 24, Annex 5, Volume II.

Many association cases show expected or potential impacts on society

As can be seen in Figure 5.7 in Section 5.2.4, in more than 90% of association cases the impact of association projects on society considered to be low or very low, meaning that so far there are hardly any impacts on society visible. However, in many cases expected or potential impacts on society are well-argued. Typically because knowledge has been created that in the long run may lead to an impact on society. Expected impacts on society are mostly of an environmental nature, sometimes in conjunction with commercial impacts on the SME community. Text box 8, Annex 4, Volume II presents an illustration of this.

Case studies confirm that economic effects are realised by a minority

Regarding the development of employment, turnover and profitability, i.e. economic effects on the participating SMEs, only a minority of case studies already report on concrete results[152] which are mainly explained by the fact that project outcomes did not yet lead to commercial success.
In some cases however, SMEs report that thanks to FP7 funding, they were able to survive the post 2008 crisis. Some SMEs have protected Intellectual Property Rights (IPR), but in none of the case studies, SMEs refer to financial income from licencing.

It needs to be underlined, however, that varies factors have to come together (e.g. further development of prototype, up-take by industry and consumers) before such potential impact becomes real.

One third of SMEs in association cases report economic impacts but it is difficult to mention concrete economic impacts

Association projects have had an impact on commercial success in almost a third of the association cases. However, in most cases the impact is limited to a small subset of participating SMEs and most of the time the impact cannot be quantified in terms of employment, turnover, and profitability. In a couple more cases, there is good reason to expect that the project will shortly lead to commercial success.

- Typical impacts are an *expansion of the market*. One SME is offering its system, which was developed as part of the project, in other countries and is considering establishing permanent representations there. This impact is a direct consequence of the transnational character of the association project. The SME expects increases in turnover of 0.5 million Euro once the system is launched in other countries. Another SME could expand its market, exporting its chocolate products to Japan and the US, due to the longer shelf-life of its product. The longer shelf-life of the product is a direct consequence of the SME applying the research results from the association project in its products.[153]
- The case studies also show more subtle impacts. With regard to the expansion of market, there is the example of a small Eastern European SME in a non-R&D intensive sector that exports to Germany as part of its business activities.
  It cannot be said that the association project has directly helped the SME to increase its exports to Germany. However, participating in the project has given the owner more confidence, has helped him conduct better negotiations. So indirectly, the project has helped the SME increase its exports.
- Another typical impact is the *improvement of production processes*. Two SMEs, both in the food industry, could improve their production process by applying what they learned in their association project. In both cases, this has led to a reduction of waste and cuts in production costs. One SME estimates its reduction

[152] See Text boxes 25 and 26 in Annex 5, Volume II.
[153] See showcase PROPRALINE in Annex 6 in Volume II.

of waste to be around 10%. The improvement of the production process also leads to improved products and an increase in sales.

- Another SME, again in the food industry, changed the recipe of its products as a result of its participation in the association project. As a result, the SME is selling more of its product, and has also introduced more varieties. Here, the impact is an *increase in sales* as a result of an *improved product* and an *expansion of the product range*.
- Another impact is an *increase in sales* as a result of a *new product*. But this is a rare instance as in association projects products developed do not normally reach the market, rather they 'get stuck' somewhere between the prototype and market penetration. However, in one project, the product (developed in the project) will reach the market in 2014. This will have an enormous impact on the SME that drove the project, being the producer of the product. The potential market is the entire EU. So far, the project is in the final stage for market penetration and mass production, and requires investment partners and additional resources. There are also licences for other participating SMEs in the project, as they are part of the supply chain. When this technology goes to the market, the extra turnover may appear in their accounts and raise their incomes as well.
- One SME used the 100% of the funding coming from the association project to set up and modernise the existing lab facilities of the company, equipping it with the technologies required for the project. So when the project was finished the SME had a very well equipped and modern laboratory facility. These facilities made the SME a very interesting company for other product manufacturers in the industry, and 50% of the company was sold to a multinational two years ago.[154]
- Finally, a *start-up company* was founded in February 2012 as a result of an association project, selling the product developed in the project. Turnover in 2012, its founding year, was € 40 000, and turnover in 2013 is expected to be approx. € 120 000. The enterprise is also planning to increase its number of employees by one or two employees.

Overall, case study authors assessed the impact on participating SMEs to be high and very high in about 25% of cases, medium in about 50% of cases, and low in about 25% (see Figure 5.7 in Section 5.2.4).

No evidence found yet for economic benefits of wider SME community

Association projects aim to render clear exploitation potential and economic benefits for the SME members of the associations involved. Hence, it is imperative to also look into how the association projects have benefited the wider SME community commercially and not only those SMEs directly involved in the project.

Currently, there is no evidence that the association projects have had an impact on the commercial success of the wider SME community. This may change in time when products are developed further and commercialised. In some cases this is more realistic than in others because the time horizon to marketability is limited, technical problems are solvable and key players in the consortium are committed to commercialising the prototype. If that is the case, business models whereby members of associations may get a discount when buying the finished product may be used.[155]

With regard to long-term impacts expected on the SME community, these are mostly related to improved competitiveness, typically resulting from cost reductions implemented using a new product or process developed in the association project. It has to be underlined, however, that these are only expectations, not substantiated

[154] The question remains why tax payers should pay for modernising the lab equipment of an SME that then gets sold to a multi-national.

[155] See showcases OPTIMALT and TIGI in Annex 6 in Volume II.

by evidence. Having said that, in a handful of association projects no long-term impacts on the SME community are expected at all.
Overall, impacts of association projects on the wider SME community were considered to be low or very low in about 85% of cases (See Figure 5.7 in Section 5.2.4).

6.2 European Added Value (EAV)

European Added Value - see introduction of the concept in Section 1.5 - is defined in this context as "the value resulting from EU support for RTD activities which is additional to the value that would have resulted from RTD funded at regional and national levels by both public authorities and the private sector".

The evaluation questions in this area are:
Q11. Has the support from the initiative resulted in values which are additional to the values that would have resulted from RTD funded at regional and national levels by both public authorities and the private sector?
Q12. To what extent do actions at EU level complement and enhance the impact of measures taken at national level by governmental and non-governmental (private sector) actors?

Findings on EAV of the RSME scheme
1. The RSME scheme's EAV is considered positive, as it operates at a scale and scope that the private sector does not come close to matching and provides the kind of support that does not exist in the great majority of EU Member States.
2. Two thirds of the SMEs participating in the Research for SMEs scheme state that the effects realised could not have been achieved in a national or regional funded programme or through privately financed research projects.
3. Three types of EAV are distinguished in the assessment of EAV: a). Technological added value, namely the added value of a European project due to technical reasons like specialised knowledge, or equipment (high or very high in 60% of the projects analysed in more detail), b). Economic added value, namely the added value of a European project due to access to international customers, or markets (high or very high in nearly 30% of projects analysed), and c). The European funding is compensating a lack of alternative funding (high or very high in more than 70% of cases).

Association projects only
4. The European Added Value of association projects is considered high to be very high in 50 to over 70% of cases for the three dimensions of European Added Value mentioned with item 3 above.

When discussing European Added Value, attention will be paid to both:
- EAV at the input side: FP7 should focus on topics and activities that do not get (sufficient) attention from existing initiatives in EU Member States from public or private sector agents;
- EAV at the output side: are FP7 activities delivering more benefits compared to existing initiatives in EU Member States of public or private agents.

Stakeholders are strongly positive on EAV of RSME

Member state officials and National Contact Points (NCPs) were strongly positive about the RSME scheme's EAV, arguing that the European scheme provides support to SMEs at a scale and scope that does not exist in the majority of EU Member States. Specifically, our interviewees report that:
- scale, RSME awards are an order of magnitude larger than the assistance available through the majority of national SME schemes;
- scope, RSME transnational partnerships provide access to international markets, value chains, networks and competences that are beyond the reach of the majority of innovation support provided through national schemes.

Several officials remarked positively on the RSME scheme's basic concept, providing ambitious SMEs, with little or no in-house R&D capacity, with access to business-

friendly technology development capabilities and facilities. Contributors report this is not a type of innovation support that is widely available, albeit national R&D schemes that provide SMEs with grants or loans (on a competitive basis) will fund either individual SMEs or groups of SMEs, including technology consultancies, to carry out product development and prototyping on a cost-shared basis. That is, these schemes will consider applications from non-research performing SMEs working in conjunction with research performers. Several contributors mentioned innovation vouchers, which may be found at either national or regional levels, as an example of a type of scheme where medium-tech SMEs can get government help with accessing high-tech capabilities. However, our interviewees acknowledge that these voucher schemes sit at the other end of the spectrum to the RSME mechanism, inasmuch as they provide very small grants to large numbers of SMEs in order to encourage firms to explore possible development projects with local universities or research institutes (tasters), whereas RSME projects are large enough to support substantial development work and even full-scale prototypes and demonstrators. The kind of 'club research' financed through the Research for associations projects is arguably even more unusual in a typical national innovation support landscape.

People also remarked on the added value of the RSME scheme, when compared with the Cooperation Programme, singling out the more bottom-up strategy (non-thematic) and the more SME-friendly procedures.

Lastly, our interviewees took the view that the private sector will not provide direct support of this kind, and as such there is an obvious market failure here that the public sector can usefully address. Limited and uneven public support at the level of individual Member States further strengthens the case for maintaining an EU-level scheme for SME innovators.

SME interviews show that in some MS EAV at input side is high

From the SME interviews appears that - with regard to EAV at the input side - *"access to financial assistance not available nationally or regionally"* as motivation for participation is in particular high for SMEs from Germany, Italy, Spain, UK and several associated countries, e.g. 67% of all German SMEs interviewed state this; compared to overall only 49%.

Two third of interviewees mentioned EAV at the output side

With regard to EAV at output side SMEs have been asked in the interviews whether the effects realised could also have been achieved in a national or regional funded programme or through privately financed research projects. One third of the respondents in the Research for SMEs scheme answered yes and two thirds no.

Interviewees had different views on EAV at the performance side

With regard to effects on the economic performance of the company, the differences are smaller. 43% answered that these effects could also have been achieved with projects financed in their own country, vs. 50% that stated this was only possible with EU level support. This is especially the case, i.e. highest EAV, for all networking and collaboration categories.
The effects with regard to behavioural additionality score in between: 39% said this could also have been achieved nationally, 53% answered no.

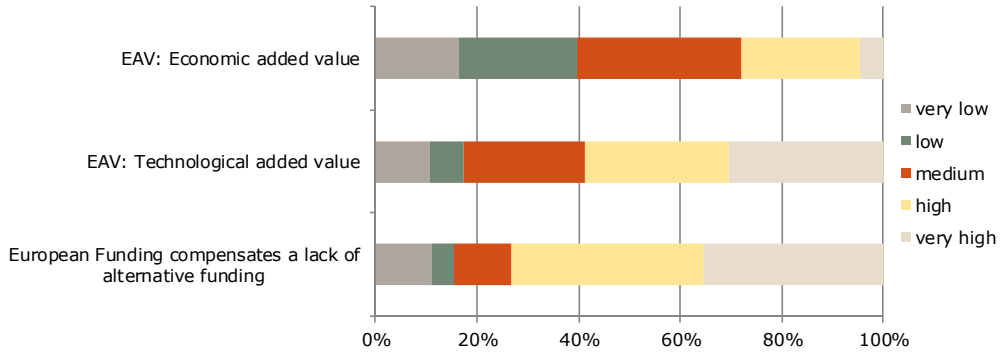
So across these three aspects of EAV, the majority of SMEs interviewed report EAV at the output side.[156]

Case studies in Research for SMEs

Three types of EAV are distinguished in the assessment of EAV in cases:
1. technological added value, namely the added value of a European project due to technical reasons like specialised knowledge, or equipment;
2. economic added value, namely the added value of a European project due to access to international customers, or markets;
3. the European funding is compensating a lack of alternative funding.

The assessment of these is shown in Figure 6.5.

Figure 6.5 European Added Value assessed in 47 cases in the Research for SMEs scheme



Source: Technopolis Group 2013, analysis 47 case studies in Research for SMEs.

Cases Research for SMEs: EVA highest for lack of alternative funding and technological knowledge

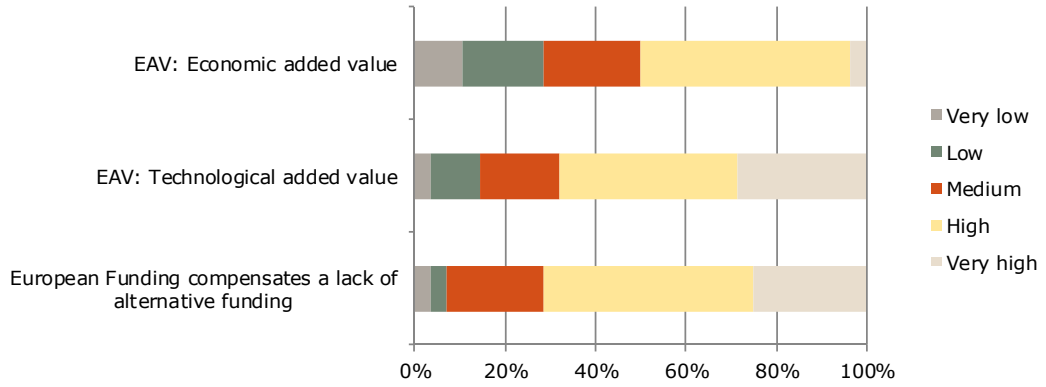
Clearly, SMEs strongly benefit of European funding as for this kind of cooperation, there is a lack of alternative funding opportunities. SMEs also profit largely from access to specialised knowledge or equipment in international partnerships, whereas economic EAV is rather low, and obviously lower than in case studies observed in the Cooperation Programme, where SMEs reported for instance about benefits from accessing big industrial players on the European level.[157]

RSME needed for scale and scope; other funding is complementary

Asked about the relation of RSME funding and national or regional funding, the situation of course varies depending on the national context. But even where interesting funding schemes for SMEs exist, they generally don't cover the type of projects funded under FP7, in terms of scale and scope. Complementarities with national funding programs are referred to when it comes to follow up projects, and as necessary funding of projects that prepare the ground for successful FP7 projects.[158]

[156] See Section 6.2 European Added Value in Annex 3, Volume II.
[157] Text box 31 in Annex 5, Volume II presents some illustrations of EAV related to international access to competencies.
[158] Differences and complementarities between FP7 RSME funding and national initiatives are illustrated in Text boxes 33 - 35 in Annex 5, Volume II.

Figure 6.6 European Added Value of association projects



Technopolis Group 2013, analysis 28 case studies in Research for SME associations.

More than half of the association cases mention EVA on three dimensions

As can be seen in Figure 6.6 European Added Value of association projects is considered high to very high in 50% to over 70% of cases for the three dimensions of European Added Value measured. These assessments are largely comparable to those of Research for SMEs cases (see Figure 6.5 above). The differences between the three dimensions are more pronounced in the Research for SMEs cases than in Research for SME association cases.

In most association cases: FP funding is compensating a lack of alternative national or private funding

European Added Value in terms of FP funding compensating for a lack of alternative national or private funding is considered to be high or very high in 20 of 28 observed cases. With regard to national public R&D funding, it was underlined that in many countries public R&D funding has become scarcer because of the economic crisis. Also, the added value of association projects is that they can address topics relevant to an international industry, such as shipping, and thus compensate for a lack of national interest in supporting an international industry. Furthermore, the scope, the budget and networks of association projects are larger than in nationally funded projects; funding for projects of such calibre is simply not available nationally. Last but not least, *"Research for SME associations"* is quite an exceptional scheme that does not have many national counterparts, making it highly complementary to nationally or regionally funded projects.

With regard to the availability of private funding, the economic crisis was also cited as a reason why private money was not an option. Private money for R&D is particularly difficult to find in industries which are fragmented and not research-intensive, e.g. the food or agricultural industries. In these instances, the FP clearly compensated for classical market failure. In practically all cases, it was well argued why national or private money was not an option.[159]

Most association cases show EAV due to specialised knowledge delivered by international partners

European Added Value due to technical reasons - that is the FP project gives access to specialised knowledge and equipment that do not exist nationally - is also high or very high in almost 70% of cases, with access to specialised knowledge much more important than access to specialised equipment. There is a wide variety of examples of EAV due to technical reasons but the typical story is that transnational

[159] See Text box 10 in Annex 4, Volume II for examples.

cooperation was important due to the fact that partners delivered their knowledge in specialised fields, and this knowledge was not available in one country only.[160]

Half of the association cases notice EAV due to European/international dimension

European Added Value due to international markets - that is FP projects give access to knowledge on international markets and tackle problems that have a European or international dimension - is high or very high in about 50% of cases and thus somewhat lower than the other two dimensions of EAV.

There are typically two main lines of argument with regard to EAV due to international markets. One line of argument is that the main value of European cooperation was the knowledge regarding market characteristics and that the involvement of different nationalities allowed a more precise assessment of potential market demand. Another line of argument is that European industries face the same regulation and market challenges, so that there are clear reasons to benefit from a project at European scale.

Another less frequent argument for the added value of EU funding and European collaboration lies in pursuing the advantages of increased standardisation and reduced fragmentation (technical standards, meta-data, architectures, test procedures, etc.).

6.3 Behavioural additionality

Behavioural additionality concerns the effects on the funded SMEs' behaviour and strategy as a result of their participation in FP7, i.e. receiving government subsidies (See also introduction in Section 1.5).

The evaluation questions in this area are:

Q13. Have the participating SMEs changed their behaviour as a result of the participation in the initiative?

Q14. Have participating SMEs increased their collaboration with new partners at national/EU level (enterprises, research organisations, universities) as a result of participating in the project?

Findings on behavioural additionality of the RSME initiative

The following effects with regard to behavioural additionality can be asserted in the analyses:

a) getting involved in collaborative research and innovation more often;
b) professionalised research and innovation activities;
c) getting involved in research with a longer 'time-to-market';
d) conduct research and innovation more often; and
e) conduct research and innovation more regularly.

Behaviour of SME associations

For the RSME association scheme impact on associations' behaviour is considered to be low or very low in more than 60% of cases. Only 25% of the associations have changed their services to members and 30% have changed their cooperation and networking with other SME associations as a result of project participation.

Stakeholders have no good view on behavioural additionality but given the pre-participation degree of innovation of SMEs little effects are expected

The stakeholder interviews provided very little substantive feedback relevant to this question, for the RSME initiative. Stakeholders have no good programme-level view as to whether SME participants go on to do further projects in collaboration with

[160] Some illustrations of EAV due to technical reasons and international markets (access to competencies and international markets) are shown in Text box 11, Annex 4, Volume II.

RTOs or otherwise change their innovation behaviour. Indeed, the main contribution on this topic is arguably a negative point whereby a substantial proportion of all SME participants already have R&D staff / budgets and they are attracted to the scheme by its financial support and non-thematic approach. From this perspective, the RSME initiative is delivering rather less behavioural additionality than one might expect when considering the programme rationale and objectives.

SME interviews reveal different kinds of behavioural additionality

Asked about the effects of their participation in Research for SMEs, the responding SMEs mentioned especially the following in interviews:

- 59% stated to get involved in collaborative research and innovation more often;
- 42% professionalised its research and innovation activities;
- 41% get involved in research with a longer 'time-to-market';
- 38% conduct research and innovation more often;
- 37% conduct research and innovation more regularly.

Case studies Research for SMEs: mainly effects on innovation structuring and engagement

Behavioural additionality is potentially highest for participants that make substantially new experiences. Innovative SMEs for whom participation in EU Framework Programmes is a well known activity might also continuously change due to learning effects, still case studies show that being innovative and research oriented from the beginning has often been forwarded as explanation for low assessments of behavioural additionality. Indeed, 20 out of 45 case studies providing this assessment state that behavioural additionality[161] was low or very low. In 13 cases it was medium, in 6 high and in other 6 very high. In these latter cases, the main effects are related to:

- influence on R&D strategy and budget;
- engagement in projects with longer time to market;
- better management of innovation projects;
- a new approach in Intellectual Property (IP) negotiation and management.

Case studies Research for SME associations: Small impact on services delivered by SME associations

For the association cases, a closer look was taken at how project participation has changed the behaviour of SME associations. On the whole, impact on associations' behaviour due to project participation is considered to be low or very low in more than 60% of cases (see Figure 5.7 in Section 5.2.4). Only a small part of the associations (25%) have changed their services to members as a result of project participation, and in most cases only a small impact on the SME association has been noticed.

There are two main reasons why SME associations have not changed their services as a result of project participation. On the one hand, the prototype, demonstrator or tool developed in the project is not yet on the market, so the offer or information on the new product cannot be offered to members yet. On the other hand, some SME associations have been involved in R&D projects for many years and have an established way of integrating results into their services.

[161] Effects on innovation behaviour: structuring and increased engagement are illustrated in Text box 36 in Annex 5, Volume II.

Association cases: About one third of the associations changed their cooperation and networking with other SME associations

Only a minority of SME associations (30%) has changed its cooperation and networking with other SME associations as a result of project participation. The main reason why SME associations have not changed their networking with other SME associations is that they were already well networked with other SME associations before the project began.

Association cases: Also one third changed their cooperation with R&D organisations

In about a third of cases the association has changed its cooperation with R&D organisations based on the experience in the project. There are main three reasons why SME associations have not changed their cooperation with R&D organisations:

- No relationships with R&D organisations were built up during the project because there was no cooperation or contact between them; this result is, of course, not commensurate with the scheme's objective, which gives SME associations the opportunity to subcontract research to RTOs, implying that there would be (at least) a customer-seller relationship.
- The relationships built up during the network were not sustainable.
- The SME association already has an established relationship with the R&D organisations in the project.

6.4 Innovation

Innovation refers to bringing a new or significantly improved product or service to the market, implementing new manufacturing, organisational or marketing processes. So in line with the OSLO Manual innovation also includes a new organisational method in business practices, workplace organization or external relations.

The evaluation question in this area is:

Q15. Have the SMEs participating in the programme become more innovative, in terms of for example introduction of innovations new to the company or the market?

Findings on innovation related to the RSME initiative

1. The question whether the SMEs have become more innovative by participating in RSME, can be answered with "predominantly, yes", because the majority of participating SMEs could: a) create new innovation-related partnerships and networks; b) become more aware of the potential benefits; c) act accordingly in terms of professionalization and other behavioural aspects; and d) managed to produce innovations new to the market.[162]
2. Similar to the Cooperation Programme, the effects of participation in the RSME initiative seem to be cumulative. Thus, SMEs that participated in other projects before realise stronger effects with regard to their overall innovativeness than newcomers.

Cases SME associations

3. In about half of the association projects analysed, an impact on the innovative capacity of participating SMEs can be observed. However, there are also a number of cases where there is no impact on innovative capacity because the participating SMEs were innovative in the first place. Conversely, for other SMEs there was no impact on innovative capacity because they are far from being R&D oriented. In other words, they lacked the absorptive capacity to benefit from the project.
4. Association projects aim to render benefits for many of the SME members of the associations involved. Hence, it is imperative to look into how the association projects have benefited the wider SME community. However there is very little evidence that the association projects have led to an increase in innovative capacity in the wider SME community so far.

[162] From the case studies it became clear that often prototypes get developed but most often they do not reach the market during or in a period of 1-3 years after completion of the project (not commercialised yet).

Few stakeholders have a good view on SMEs' innovation: small effects are noticed

The stakeholder interviews were not particularly illuminating on this topic, as few commentators have a good view of project or programme outcomes. A small majority of contributors was unable to comment at all. For those that had a view, the balance of opinion is reasonably clear: RSME is helping SMEs to innovate, in some small degree. Bringing together the feedback of those with a view, inevitably partial, examples of all innovation types are found: product, service, process, organisational and business models.

SME interviews show a multitude of innovation effects

The overall question of whether or not the SMEs have become more innovative at large requires a combination of several findings but can be answered with "predominantly, yes" on the basis of the SME interviews. The majority of SMEs:

- create new innovation-related partnerships and networks;
- became more aware of the potential benefits;
- acted accordingly in terms of professionalization and other behavioural aspects.

As much as 67% of all participants in Research for SMEs state that following the participation in the project they implemented an innovation.[163]

- 86 % of these SMEs (this is 58% of all participants) state that this innovation was new to the market;
- 92 % of these SMEs (this is 62% of all participants) state that this innovation was new to the firm.

These percentages are rather high, but one should keep in mind that innovation means available at the market and not necessarily being successful (allready).

The majority of SMEs funded have realised some innovation-related effects of their participation, most did realise a multitude of effects. The overall variety of effects on SMEs' innovativeness is quite large.
The effects seem to be cumulative, i.e. each participation and its effects build upon previous participations and the respective effects. Thus, newcomers realise less or less strong effects with regard to their overall innovativeness.

Case studies on RSME reveal that in most cases more time is needed for commercialisation

From discussion of commercialisation it shows that only a few outcomes of FP7 RSME projects have already been largely implemented in the market, firstly because this funding initiative is particularly appreciated as it opens an opportunity for SMEs to engage in projects with longer time to market, and second, because even in projects aiming and shorter term developments, commercialisation needs further investment. In a very strict sense, this Interim Evaluation can not yet report on successful market implementations. However, there are several examples of innovations resulting from cooperation. One important feature is that with the help of RSME, SMEs engage in projects of a wider scope that made their innovations more complex and ambitious with a chance of higher success.

Showcases as presented in Annex 6 of Volume II illustrate in a comprehensive way the interaction of the SMEs, its innovations and its FP7 participation.

[163] It should be noted that these statements should be interpreted carefully as it was also learned - especially from case studies - that such innovation new to the market might be worked on, but actual implementations new to the market are rare. Mostly the actual commercialisation only takes place after completion of the FP7 project.

Association cases

For the association cases, it was analysed how FP participation impacted on the innovative capacity of participating SMEs and the wider SME community.

Impact on innovative capacity in about half of participating SMEs in association cases: the extent depends on their role

In about half of the cases, an impact on the innovative capacity of participating SMEs can be observed. However, this impact can be small and only relate to some of the SMEs active in the consortium, depending on their role. For example, for end-user SMEs increases in innovative capacity tends to be small because their role is limited to giving industry relevant input to prototype/technology development and buying the resulting product should it get commercialised.

Also, in a number of cases there is no impact on innovative capacity because (some of) the participating SMEs were innovative in the first place. Conversely, for other SMEs there was no impact on innovative capacity because they are far from being R&D oriented. In other words, they lacked the absorptive capacity to benefit from the project.[164]

Sometimes increase in innovative capacity is closely linked to behavioural additionality. This is particularly the case when, due to participation in the association project, an SME starts cooperating with research organisations. For instance, an association project gave rise to small companies with little innovative capacity working together with large R&D centres, and for this reason, these companies were able to access resources that otherwise they would not have been able to access.

Case study authors assessed the impact of the association projects on SMEs' behavioural additionality to be low or very low in almost 40% of cases (as shown in Figure 5.7 in Section 5.2.4). This is in line with the result that impact on SMEs' innovative capacity is limited to about half of the cases.

Impact on innovative capacity of SME community in only a handful of association cases

Association projects aim to render clear exploitation potential and economic benefits for the SME members of the associations involved. Hence, it is imperative to also look into how the association projects have benefited the wider SME community (and not only those SMEs directly involved in the project). Having said that, there is very little evidence that the association projects have led to an increase in innovative capacity in the wider SME community. In fact, in less than a handful of cases is there evidence that the project has in some way impacted on the innovative capacity of SMEs beyond the consortium.

The most common reason why there has not been any impact on the wider SME community is because no marketable product or service has been developed yet. In other cases improving the innovative capacity of the SME community will never be an impact because the project had not been geared towards improving the innovative capacity of the wider SME community. For example, the SME community will simply buy and use a new and improved product developed in the project (e.g. a new fertilizer).

[164] Text box 11 in Annex 4, Volume II, provides some examples of lack of impact on innovative capacity in association cases.

Part IV Findings and recommendations

7 Overview findings and comparison of the two programmes

Section 7.1 reflects on the findings about the Cooperation Programme in Chapters 3 and 4 and the Research for the benefit of SME schemes (RSME) within the Capacities Programme in Chapters 5 and 6. Section 7.2 focusses on comparisons between the two. In the text references are included to the various recommendations presented in Chapter 8, such as => Recommendation 3; to highlight the link between findings and recommendations.

7.1 Reflections on findings

SMEs participating in FP7 represent a small but important part of the European SME community: they show particularly high growth rates both in turnover and employment.[165] A majority of these SMEs are already active in research and/or development before participating in FP7.[166] For the majority of these SMEs research and innovation seem to play a central role in their business and growth strategy.

Whereas universities, research organisations and large multinationals are globalised and used to international cooperation, participation in FP7 Cooperation and the Research for the benefit of SME schemes shows a particularly high European Added Value to SMEs, as it represents a good opportunity for international cooperation. In addition it provides access to projects of a bigger scale and scope, both in terms of size, partners and competencies involved, geography, present and future partners and markets, and time to market.

7.1.1 Cooperation Programme

Thematic area

There were strong views articulated by several Commission officials about the importance of SMEs within their particular domain (e.g. energy and environment; ICT and NMP), however there were rather more people that argued in favour of thematically open calls for proposals in Cooperation which are reported to be a better fit for the great majority of SMEs.

Instruments

In terms of instruments, it is evident that the successful completion of FP7 Cooperation projects still leaves SMEs with a lot of work in order to commercialise research results. Even in the light of this being an interim result, without further support for demonstrators or even marketing, many potentially valuable initiatives will be stillborn => Recommendation 5.

Support for innovative SMEs is potentially important

The analyses show that SMEs participating in the FP7 Cooperation Programme typically are young, innovative firms with strong ties to research organisations. Relative many are spin-offs from universities and research organisations, staffed with research personnel that have experience with FP projects from former jobs. Whereas universities, research organisations and big industry typically interact

[165] See results quantitative analysis, i.e. Sections 4.1 and 6.1 or Annex 1 in Volume II for more details.
[166] See findings from SME interviews and case studies in Sections 3.1, 3.2, 5.1 and 5.2 and Annexes in Volume II.

globally in their work, innovative SMEs are more dependent on support structures for international collaboration. Business size also restricts the potential to invest in longer term research. Therefore, the European Cooperation Programme has a high potential for innovative SMEs.

Due to relatively high funding rates for SMEs, these projects present an opportunity to engage in research and collaboration activities that are not primarily oriented towards short-term commercialisation. Of course, the characteristics of industries that SMEs are active in are mirrored in the outcomes of the projects, as for instance, commercial benefit is achieved more often in the thematic area of ICT, whereas in the thematic area of Energy, due to strong links to environmental criteria, benefits for society are mentioned more often, at least as a potential impact of the project.

Continuity in networks of participants

EU Framework Programmes have a long history and so have certain consortia: a well-established outcome of a FP Cooperation project is a further FP Cooperation project. It would be exaggerated to say that these consortia clearly follow the rule "never change a winning team"; still, the sustainability of cooperation is often reflected in further project submissions. There are of course SMEs that refer to industrial contracts with partners known from FP Cooperation projects, but this does not appear to be a dominant pattern. Reputation - also as an interesting partner for FP projects - is a key factor for SMEs. Reputation is imported because:

- it is a benefit for networking, the door-opener for further contacts und contracts;
- it is a facilitator for behavioural additionality, increasing self-confidence of SMEs helps in acting on the international arena and in projects of larger scale and scope.

Turning around this argument leads to the conclusion that it is relatively difficult for SMEs to enter FP Cooperation projects for the first time[167] => Recommendation 1.

Our statistical analysis shows that by addressing SMEs, either through SME specific calls or by imposing a quota for SMEs in FP Cooperation projects, SMEs are over indeed more often included in projects.[168] The case studies underline that SMEs tend to obtain greater benefit from FP7 Cooperation projects if they are at the centre of the project, either as coordinators or in a less formalised manner. In some cases, SMEs act as initiators and coordinators of FP Cooperation projects, in a role of technology integrator. This can be understood as a best practice of open innovation in networks.

Side effects of focussing on SMEs

With the Cooperation Programme, it seems that introducing SME quota has caused some difficulties, even if it has produced a significant increase in SME participation as compared with FP6. The Research Executive Agency (REA) and several National Contact Points (NCPs) indicated that a significant minority of participating SMEs are dissatisfied with their involvement in projects and access to the benefits produced. The Commission's efforts to incentivise greater SME participation have, perhaps unsurprisingly, encouraged a degree of game playing, with SMEs included in bids for cosmetic reasons, simply to improve the prospects of the proposal in the evaluation process) => Recommendation 4.

[167] Still it was shown in Table 3.2 - based on eCorda data - that 73% of SMEs participating in a Cooperation project only participate in one Cooperation project in FP7. They might however have experience in earlier Framework programmes.

[168] See Figure 3.3 in Section 3.2

7.1.2 Research for the benefit of SMEs

RSME accessible initiative for SMEs

The Research for the benefit of SMEs initiative (RSME) consists of two schemes:

- Research for SMEs;
- Research for SME associations.

The Research for the benefit of SMEs initiative has in many respects been a success: it is a highly attractive initiative. Barriers to entry are lower than in the Cooperation Programme. SMEs can benefit broadly from this initiative that opens opportunities which would not be accessible otherwise, notably in terms of accessing high level knowledge on an international level and in engaging in projects with a more ambitious research agenda and longer time-to-market periods.

Who is in the driver's seat of RSME projects?

A key difficulty of RSME comes from the classical principal-agent dichotomy, as the funding organisation has no perfect insight in the story behind a construction of a consortium and the key beneficiaries of the project. The basic idea of including in one consortium SMEs and Research and Technology Organisations (RTOs) who should sell research services to these SMEs, who will hold Intellectual Property (IP) on the RTOs results, can be used by RTOs in cases where they can control the definition of their own activity in the project.
Indeed, RSME projects are often initiated by RTOs, convincing SMEs to buy in their services using EC funds. As long as these services are in line with the SMEs strategy, this is coherent with the requirements of the initiative. Still such situations are quite different from the basic idea: an SME or group of SMEs identifying a technological problem in their own manufacturing process or with regard to their own product portfolio.

With the RSME initiative, there was a general anxiety among stakeholders such as SME representatives at EU or Member State level about the current financial strategy, wherein it gives the money to the RTOs. This can be problematic, as it encourages organisations to make a business out of designing and managing projects for SMEs, and while that can work well in some cases, it was said to cause difficulties from time to time with low levels of project engagement or ownership by SMEs. This can result in higher levels of project failure and more formal complaints too, which together reduce the effectiveness and efficiency of RSME overall => Recommendation 4.

Does the Research for SME associations scheme contributed to its specific and general objectives?
The Research for SME associations scheme aims at developing technical solutions to problems common to a large number of SMEs in specific industrial sectors or segments of the value chain. The analysis shows that in a majority of cases, association projects do indeed aim to develop technical solutions to problems common to a large number of SMEs in specific industrial sectors or segments of the value chain. Some projects also aim to support SMEs to conform to European norms and standards, and to meet regulatory requirements in particular European Directives.

SME associations typically play an important role, especially in communicating the needs of their SME members to all project partners and in dissemination results of the project to their members, but they are not necessarily always the driving force behind an association project => Recommendation 4, 6.

However, not all association projects target actual problems common to a large number of SMEs in specific industrial sectors or segments of the value chain. In a handful of cases studied the purpose of association projects was somewhat perverted, and the project built around a research idea that mainly benefitted one particular party, with the associations playing an artificial role. Similarly, projects are not always driven by SME associations. There is the danger that they are driven by RTOs who lack a deeper understanding of the industry and market needs => Recommendation 4.

Role of SME associations

The Research for SME associations scheme was thought to be a very good idea in principle, but many projects have struggled with the very limited capacity and capability within the great majority of Europe's SME associations at national and European level. These intermediaries tend to be rather small with little or no in-house capacity to lead or coordinate international technology projects. Also from the stakeholders interviews information merged about a higher failure rate for these projects as compared with FP7 projects overall[169] => Recommendation 6.

Results for the wider SME community in a given industry (all members of the SME association)

With regard to the clear exploitation potential and economic benefits for the SMEs members of the associations involved, there is no evidence so far that association projects already achieve this objective in many cases This will be again be related to the character of this Interim Evaluation: looking at projects that have only been completed a short while ago. Only in rare cases have FP7 projects advanced far enough to allow marketing a product => Recommendation 5.

7.2 Comparison of the two initiatives

In the evaluative chapters 3 - 6 there are text boxes at the start of each section with the main findings for the seven evaluation aspects studied. In addition to this more descriptive Section 7.2, Appendix 3 brings these text boxes together in seven tables to allow identifying similarities and differences with regard to the functioning and outcomes of the Cooperation Programme on the one hand and the two schemes in Research for the benefit of SME *(RSME) in the Capacities Programme on the other hand:*

- Research for SMEs;
- Research for SME associations.

Relevance

The two initiatives are quite distinct in their offer to SMEs, but both are relevant to the research and innovation needs of SMEs in Europe. The pertinence is illustrated by the thousands of SMEs that participate, some 19% of all participations in Cooperation are SMEs, in RSME obviously a much higher percentage: 62%. The target of 15% of budget of the Cooperation Programme to be allocated to SMEs is achieved (over 16%). In RSME as much as 88% of the budget is allocated to SMEs as shown in Figure 5.4.

The RSME initiative is in general more relevant for SMEs than the Cooperation Programme, in large part because it is concerned with the needs of innovation-active SMEs which are a large constituency within the EU. By contrast, the Cooperation

[169] This aspect does not show up in the SME interviews and case studies done as they focussed on completed projects.

Programme is concerned primarily with advancing the technological frontier and as such is most relevant to a much smaller group of high-tech SMEs with an international orientation. This very much smaller constituency may, however, include a greater number of SMEs with the potential to grow to scale and thereby do proportionately more to advance Europe's knowledge economy globally => Recommendation 1.

However not looking at the wider SME target group, but looking at the SMEs that are actually participating, the picture is different. The Research for SMEs scheme is considered to be (highly) relevant for nearly 2 out of 3 cases studied. Although - as considered above - the RSME initiative has specially been developed for the benefit of SMEs, the score in the Cooperation Programme is higher: nearly 3 out of 4 cases studies have been assessed as being (highly) relevant for the SME observed.

The specification of objectives is stylistically similar across both the Cooperation Programme and the RSME initiative, however, as one might expect given their respective goals, the Cooperation Programme treatment of SME objectives is very much more diffuse than is the case for the RSME initiative. It might be helpful from a communication perspective if SME specific objectives are described also at a more general level for the Cooperation Programme.

From a governance perspective, it is contended that neither initiative has adequately specified its SME-related objectives. The objectives are not SMART, as is the case for FP7 overall. While such an approach can bring its own problems (e.g. perverse effects and unintended consequence of poorly conceived or overly prescriptive performance measurement systems), clearer and more precise definition and communication of the specific SME-related objectives of the programmes ought to improve SME engagement and SME actions and thus might increase the benefit of the programmes for their respective target groups. => Recommendation 3.

The evaluation team takes the view that the Cooperation Programme is intrinsically more challenging for Europe's SMEs to follow, inasmuch as it is issuing large numbers of targeted calls for proposals that are of varying relevance to SMEs in general. Case by case they will be relevant to one sub-set of high tech SMEs among what is already a very small population of widely dispersed businesses. Most Cooperation Programme calls are concerned with the topic primarily and are rather indifferent to the types of organisations that may choose to submit a proposal, while a minority of Cooperation Programme calls are SME-orientated in their focus and in their arrangements. These qualities may make the Cooperation Programme harder to follow for first-time or occasional users, and emphasise the importance of the targeted communication activities of the National Contact Points (NCP) networks and other intermediary structures.[170] The high-tech SMEs that do get involved however may struggle less with these aspects than the very much larger cohort of small manufacturers and service companies that may be looking to test the relevance of FP7 to their innovation ambitions => Recommendation 1.

RSME is easier to understand than the Cooperation Programme, however both initiatives are clearly working hard to make their messages relevant / clear to different audiences. This generally positive view about communications - for FP7 in general and for all audiences - is supported by feedback from the Commission's

[170] Indeed SMEs in Research for SMEs recall the programme objectives correctly slightly more often than SMEs in the Cooperation Programme which could be linked to programme objectives being closer to the companies, i.e. less abstract.

2012 survey of NCPs, which found that 80% of respondents rate information on calls for proposals as good or excellent (98% judge it satisfactory or better).[171]

There is one unanswered question about the balance of effort devoted to SME communications overall, based on a single remark by a NCP suggesting the NCP network tends to focus more on the Cooperation Programme calls than the Capacities Programme, because there are more calls for proposals and bigger budgets on offer. This left a question about the amount of effort devoted to communications with SMEs specifically, through the various intermediaries and communications channels, and whether a different communication strategy might deliver benefits through increased awareness (market penetration) and possibly more applications of greater relevance and quality.

When comparing the two programmes there is some evidence that Cooperation is more important as a replacement for national funding programmes (not limited to existence of funding but including all aspects of a collaborative research funding programme) and consequently "more relevant" to those SMEs from countries with a comparably lower Government expenditure on R&D per inhabitant.

The Research for SMEs scheme puts an emphasis on the transfer of knowledge via the buyer-customer relationship between SMEs and RTD performers (such as other SMEs, RTOs or universities). And indeed the aspect of knowledge transfer was mentioned more often by participating SMEs in RSME compared to the Cooperation Programme.
Furthermore, all market-oriented objectives rank slightly higher, which reflects the different nature of the programme. Also from the case studies it appears that SMEs that participate in Research for SMEs are more often motivated by the objective of accessing new markets: in 19 of 47 cases (40%) this seemed highly important, only in 2 cases this was perceived as not important. Compared to that, 12 of 67 SMEs studied in the Cooperation Programme were not motivated by access to new markets and in only 11 cases of 67 this was assessed as highly important (16%).

Effectiveness

SMEs rarely initiate the projects even in Research for SMEs. However, it is even less often the case in Research for SMEs than in the Cooperation Programme, which is the opposite of what one would have expected. In addition, also the share of joint decisions, i.e. the SME taking the initiative together with other organisations, is not higher in Research for SMEs than in Cooperation, both about 23%.

The 6th FP7 Monitoring Report shows that the RSME initiative dominates the FP7 "foreground" statistics[172] more generally, especially around the commercial exploitation of R&D results. In completed FP7 projects, across all areas of the FP, the Commission's monitoring system records 609 instances of commercial exploitation, 389 of which are credited to the RSME initiative and 160 for the Cooperation Programme. The difference arguably reflects the two initiatives' relative position on the basic-applied research spectrum, with the RSME initiative consciously working closer to the market. However, the degree of difference is still noteworthy given the fact that the Cooperation Programme's SME contributions are around four times greater than the RSME's. The SME specific calls in the Cooperation Programme have

[171] The results of the survey are presented in Section 3.5 of the Sixth FP7 Monitoring Report, Monitoring Report 2012, published by the European Commission, Brussels, August 2013.

[172] As explained in Section 3.2.4, the FP7 monitoring data include statistics on the numbers of reported 'foregrounds'. This is the name used by the Commission to refer to selected types of tangible and intangible project results that occur within the life of a FP7 project and can therefore be recorded in the final contract report and programme monitoring system.

also moved closer to market, with the introduction of demonstration projects for example[173].

The RSME initiative, which is dominated by SME participants, produces fewer publications and IPR-related outputs, proportionately, as compared with the Cooperation Programme thematic priority areas. It is no surprise that SMEs do less well on these particular Key Performance Indicators (KPIs). Firstly because peer-reviewed publications are less relevant - but not irrelevant - to firms as compared with public research organisations. Secondly because formal Intellectual Property (IP) is less affordable for SMEs on average and the cost of defending disclosures can mean IP is less effective in the real world as compared with secrecy. To put this in context, statistics of the European Patent Office (EPO) show SMEs account for around 10-15% of patent applications annually.[174]

Efficiency

Quite surprisingly, significantly less participating SMEs in Research for SMEs state that the benefits already outweigh the costs than in Cooperation. One would expect the reverse, because RSME projects should at least in theory develop something much closer to commercialisation and thus benefit could be achieved faster. However there are many SMEs that expect benefits to outweigh costs in future, especially many participants in RSME.[175]
In the Cooperation Programme the highest share of SMEs with a positive cost-benefit relation (presently) are found among technology users and those SMEs who had the role of defining the research/market need[176]. In Research for SMEs this is among providers of the technology basis and infrastructure (which are likely RTD-performers).

With regard to a comparison of the assessment of several implementation aspects there are little differences, only for two issues a difference was found:

- More SMEs in the Cooperation Programme are satisfied with the financial rules and funding conditions (46%) than participants from Research for SMEs (39%). This could be related to the "forced" roles of SMEs in Research for SMEs, i.e. some of them ultimately paid for research service they could have provided themselves "just because the programme required so". The case studies showed that in several cases the idea of SMEs without own research capacities resorting to external capacities for which they would gladly spend public money was not always really the case.

[173] These demonstration activities were not studied in this Interim Evaluation because only projects were selected that were finished by the end of 2012. The demonstration activities were only introduced halfway FP7 and not yet completed at that time. The call was launched mid-2011 and the expected duration of the projects was 18 to 24 Months (source: Leaflet Capacities, Research for SMEs, Demonstration Activity).

[174] No practicable means were found by which to establish an equivalent global figure for SMEs' publishing behaviour, and it is possible that the Cooperation Programme provides them with a platform for the creation of such written outputs and that as a result SMEs find it easier to showcase their technical work in high-impact journals as compared with the situation outside FP7. In a world where open innovation is said to be increasingly important, that may be a rather important means by which to develop one's brand and increase the numbers of prospective partners and clients that are aware of your business' research and innovation activities.

[175] See Figure 10 in Annex 3, Volume II on SME interviews: 64% of SMEs state that benefits did outweigh costs in the Cooperation Programme and 43% of SMEs in the Research for SME scheme. But SMEs that expect benefits (eventually) to outweigh costs is 27% in Cooperation and 42% in Research for SME, hence the sum 'now + expected' is 91% in Cooperation and 85% in Research for SME; a more modest difference.

[176] In the SME interviews 5 categories of SME participants were distinguished: define research/market need; provider technology basis; provider technology infrastructure; integrator and user.

- SMEs in Research for SMEs were more satisfied with the transparency of the project selection procedure: 47% (very) satisfied vs. 32% and last place of 11 aspects considered with SMEs in the Cooperation Programme.[177]

Impacts

For the Cooperation Programme of FP7 it has been established that growth rates for employment and operating revenue for SMEs participating in the projects are considerably higher than for SMEs in the control group[178]. Also the econometric analysis for the RSME schemes in FP7 show- although based on a relatively small number of observations - that SME participants in Research for the benefit of SMEs had higher employment growth in the period 2006-2011 than the SMEs in the control group[179].

Also over a longer period of eight years - analyses made possible by considering FP6 projects similar to Cooperation projects and RSME projects in FP7- SMEs participating in the Framework Programmes have a considerably higher employment growth and growth of operating revenue than non-participating SMEs in the control group over the same eight years.[180]

With regard to economic performance, results from the SME interviews show rather little differences between the shares of SMEs in the two programmes reporting impacts on economic performance. This is somewhat unexpected against the backdrop of Research for SMEs funding projects that should produce results closer to commercialisation.
In addition, when looking at the increase in turnover, employment and export for these SMEs that report such effects (a minority), it shows that the average increases reported are larger in Cooperation than in Research for SMEs:

- turnover 22% vs. 16%;
- employment 25% vs. 15%;
- export 28% vs. 16%.

In all three categories, the largest share of SMEs participating in the Cooperation Programme reports an increase of 20 to 50% while in Research for SMEs the largest share of SMEs reports increases of 10 to 19%.[181]

When comparing the knowledge-related effects[182], there are surprisingly small differences between the two programmes. This is especially the case when it comes to IPR, which are sort of a more unlikely outcome of Research for SMEs.[183]
With regard to FP projects as a source for more, additional and follow-up research and innovation projects there is a moderate difference.

[177] See Figures 3.10 and 5.8, respectively in Section 3.3 and 5.3.
[178] See Figure 4.1 and Figure 4.5
[179] See Figure 6.1
[180] This analysis was possible for RSME type projects in FP6 and for RSME and Cooperation like projects combined. The number of Cooperation like projects only in FP6 for which data was available was too small to arrive at significant results. See Figures 4.3 and 4.7
[181] See Table 21, Annex 3 in Volume II for detailed results.
[182] In the in-depth interviews with SME the following effects were assessed: new scientific knowledge and know how; resolving a significant technical problem that had been a chal;lenge for the enterprise and created Intellactual property (IP) that enterprise has been able to oritect through patenst etc. See Figure 18 in _ in Annex 3, Volume II.
[183] Although as mentioned before there is an issue with the enterprises classified as SMEs, not all participants classified as SMEs are business in manufacturing etc. that are looking to solve an issue in their production process or assortment of products. Also providers of management services that assist in managing FP7 projects or private RTOs are classified as SMEs.

Getting ideas for new research and innovation activities/projects from the present project is stated[184] to be the case by:
- 87% of SMEs in Cooperation;
- 80% of SMEs in Research for SMEs.

European Added Value (EAV)

Our interviews with Member State officials and NCPs revealed an almost universal view wherein both schemes are judged to have high EAV, on the input side at least. In both cases, the programmes provide European SMEs with an opportunity to participate in research and innovation activities of a scale and geographical scope that is not available at a Member State level. The schemes have been even more valuable during the economic crisis, where EU-level support for SMEs has been sustained, while national and regional measures have been reduced or terminated in order to meet the short-term requirements of local public finances.

There are evident differences in EAV between the two initiatives. The Cooperation Programme is a technically and organisationally demanding environment and typically sets a higher bar than national R&D schemes. Officials believe SME participants will be stretched more and as a consequence will tend to gain more, technically and professionally. This also spills over into higher reputational gains. The RSME initiative demands a little less of its participants. However, National Contact Points (NCPs) believe the international partnership and close support of the Commission does mean participants will tend to gain more (in terms of management and organisation) than they would through a comparable national or regional scheme. The particular EAV of the RSME initiative is encapsulated in its basic character, with very few national innovation support measures explicitly targeting innovative medium-tech SMEs with little or no in-house R&D capacity, offering access to external technology and know-how in order to enhance research-enabled innovation.

A substantial majority of SMEs in both initiatives states that the effects realised would not have been achieved in national or regional funding programmes[185]. On all three aspects covered (outputs, impact on economic performance and on behaviour), the shares confirming EAV are somewhat higher in Cooperation than in Research for SMEs.
The fact that EAV is higher for Cooperation might be linked to the "higher level" of research, which in most countries would decrease the availability of national partners (and partners abroad are almost never funded by national programmes) as such and thus increases the European added value. The analysis showed that:
- in Cooperation, the highest EAV is with regard to new knowledge gained;
- in Research for SMEs, the highest EAV is reported for all networking and collaboration categories.

Behavioural additionality

Both initiatives produced similar behavioural effects that are weaker the more tangible the effect surveyed is. All effects are slightly more common among Research for SMEs participants, which would correspond with the programme and its objectives.

[184] See Table 17 in Annex 3, Volume II.
[185] Results form the in-depth SME interviews, see Table 16 in Annex 3 in Volume II.

Innovation

From the stakeholder interviews, a number of mixed messages arise. Several people said they believed the Cooperation Programme has a bigger impact on SME innovation, with the RSME projects being rather less ambitious on average. Others, by contrast, consider SME participations to be somewhat peripheral within many Cooperation Programme projects, and argue the RSME scheme offers support that fits SMEs' innovation needs very much more closely and that a greater proportion of participants will realise some innovation benefits as a result. Both observations may be correct, with the Cooperation Programme possibly delivering fewer but more significant innovation outcomes, while the RSME initiative is delivering more innovation outcomes overall.

From the SME interviews it is concluded that the overall question whether or not the SMEs have become more innovative at large - which requires a combination of several findings - can be answered with predominantly yes for both initiatives. The majority of SMEs create new innovation-related partnerships and networks and also became more aware of the potential benefits and acted accordingly in terms of professionalization and other behavioural aspects. In addition they reported to have managed producing many innovations new to the market: 52 % of all SMEs in Cooperation and 58% of all SMEs in Research for SMEs.[186] The case studies show however that these findings should be dealt with carefully as many (results from) projects are not fully commercialised yet. Innovation in the perception of the SMEs is most likely being made available to the market and not necessarily being successful yet.

[186] See Table 22 in Annex 3 of Volume II.

8 Recommendations

8.1 Brief overview of conclusions for the seven evaluation aspects

In the evaluative Chapters 3 - 6 there are overview tables at the start of each section with main findings for the seven evaluation aspects studied. In Appendix 3 these sections are brought together to allow identifying similarities and differences with regard to the functioning and outcomes of the Cooperation Programme on the one hand and the two schemes in the Research for the benefit of SMEs initiative (RSME) in the Capacities Programme on the other hand:

- *Research for SMEs;*
- *Research for SME associations.*

In Chapter 7 more general observations with regard to the Cooperation Programme and the RSME schemes - and the difference between them - are presented.

The main findings with regard to each of the evaluation aspects are summarised in this Section 8.1 to form the basis for the recommendations presented in Section 8.2. The sign => Recommendation signals the direct link to these recommendations. In Section 8.3 some concluding remarks are made.

- **Relevance** - both initiatives score good with regard to relevance. Pertinent to SMEs but mostly to research intensive SMEs. Especially with regard to RSME this is a critical remark because this initiative aims to target the large numbers of innovation-active SMEs in Europe with little or no in-house research capability. Secondly, Research and Technology Organisations (RTOs) rather often take the initiative for developing projects in RSME. These projects may still bring benefits for SMEs but SMEs are not in the driver's seat as intended => Recommendation 4.

  Overall it is a point that objectives are nearly all formulated in a rather general way such as "strengthening the innovation capacity of European SMEs"[187] and not in a SMART way that would not only make it possible to determine whether the objectives are actually reached, but could also be of assistance in implementing more focussed programme criteria and other support actions to reach these goals => Recommendation 3. The target that 15% of the budget of the Cooperation Programme should be allocated to SME is a positive exception.[188]
  The goals of the two initiatives are clearly communicated, not only by the Commission services, but also by many different parties in Europe such as e.g. National Contact Points (NCPs) that assist in reaching target groups in a more business like language.

- **Effectiveness** - targets with regard to participation of SMEs are achieved by both initiatives.
  Also the target that 15% of the EC contribution in the Cooperation Programme should go to SMEs is achieved. In RSME, SMEs fulfil more often the role of coordinator, and are more often involved in taking the initiative than in the Cooperation Programme. But it must be noted that sometimes there is a difference between the formal and the actual roles of parties in a project. In RSME, the actual role of SMEs is sometimes more passive than foreseen in the design of these two schemes. RTOs take the initiative and SMEs are not really in the driver's seat => Recommendation 4.

187 Corrigendum to Council Decision 2006/974/EC, 19-12-2006, section objectives of RSME, page L 54/109.

188 Council Decision No. 1982/2006/EC, 18-12-2006, page L412/8.

Most participants indicate more intangible than tangible outcomes of the project; this might be related to the fact that this is an Interim Evaluation, i.e. the projects studied finished only recently and it is often too early to have market effects. See Figure 1.3 in Section 1.5 for an overview of the effects of R&D investments over time.

The role of SME associations in the Research for SME associations scheme is especially important in ensuring relevance of the support for SMEs and in dissemination of the results. To actual manage the overall project properly and to address Intellectual Property results (IPR) issues properly a specific support action is recommended => Recommendation 6.

- **Efficiency** - In the Cooperation Programme 64% of participating SMEs state that the benefits outweighed the costs (and another 27% expect this to happen in future); for Research for SMEs this figure is lower: 43% now and 42% in future. So the share of SMES that see more benefits than costs in the short or longer term combined is less different between the two initiatives, respectively 91% and 85%.

  SMEs are rather satisfied with various aspects of the efficiency of the programme. Administrative requirements for application score relatively low but not really negative. In Cooperation 33% (very) satisfactory vs 22% (very) unsatisfactory, and in Research for SMEs the percentages are a bit lower, respectively 28% vs. 31%.

  For Cooperation the expected outputs are not very clearly formulated, in RSME the score is better. As one might expect given their respective goals, the Cooperation Programme treatment of SME objectives is very much more diffuse than is the case for the RSME initiative. It might be helpful from a communication perspective if SME specific objectives are described also at a more general level for the Cooperation Programme.

- **Impacts -** The results of the various econometric analyses all show that SMEs participating in the framework programmes score much better than the control group with regard to employment growth and operating revenue for FP7 as well as for FP6.

  Also participating SMEs themselves report a range of positive tangible and intangible impacts, e.g. more cooperation, new knowledge gained, innovation competences improved, and these having a positive effect on their competitiveness. In Cooperation 54% of SMEs report an impact on turnover, for employment this is 50% and for exports 38%. Those SMEs reported an average increase of turnover of 22%, employment +25% and export +28%. In Research for SMEs 32% of SMEs already reported impacts on turnover, for employment this is 30% and for exports 27%. These firms reported on average 16% higher turnover, employment and exports.

  Measurement of economic impacts on participating firms might be improved if enterprises are requested to report some basic performance data when applying for the project and for example 2 and 5 years later => Recommendation 2.

  Besides these economic effects, very little other effects on society are reported (yet), both for the Cooperation Programme and the RSME schemes.

- **European Added Value -** European Added Value is generally considered to be rather high. EAV is higher in Member States with less national public support for R&D and innovation. Especially in RSME, participants report a high EAV. In particular, international cooperation with access to technological knowledge from abroad is highly valued. Funding from FP7 is often complementary to national funding that might be used as a step to accessing EU funding.

- **Behavioural additionality -** A significant part of participating SMEs report a positive effect on their innovation behaviour. For most aspects this concerns about 35% of SMEs in the Cooperation Programme[189] and nearly 40% of the SMEs in the Research for SMEs scheme[190]; however in both cases 59% report to get involved in collaborative research and innovation more often.

  Additionality scores also relatively high. Only a very small percentage of SMEs state that they would have undertaken the project the same way without EC funding (complete deadweight effect only 2% in Cooperation and 4% in Research for SMEs). Many of the SMEs report that they would have undertaken activities with a reduced scope, at a later date or would have start searching for other public support. As much as 53% in Cooperation and 62% in Research for SMEs state that they would not have been able to undertake the project at all without EC funding, so indicating additionality.

- **Innovation -** The majority of participating SMEs has indeed made progress in this domain. Mostly these are (as yet) intermediate results, i.e. new innovation related partnerships, more aware of benefits of R&D and innovation, and indeed managed to work on bringing innovations to the market. In Research for SMEs this is somewhat higher, and in Research for SME associations the score is a bit lower.

  In the SME interviews, 70% of SMEs in the Cooperation Programme and 67% of SMEs in the Research for SMEs scheme state that following the participation in the FP7 project they implemented an innovation. These percentages are rather high, but one should keep in mind that innovation might be understood by the respondents as being available to the market and not necessarily being successfully marketed allready.

  From the case studies it showed that in general the actual commercialisation only takes place after completion of the FP7 project and – depending on the time-to-market and other factors – could not have been covered by this interim evaluation. => Recommendation 5.

189 These other aspects are: get involved in research with a longer 'time-to-market', 38%; professionalised its research and innovation activities, 36 %; conduct research and innovation more often, 35% and 32% conduct research and innovation more regularly.

190 These other aspects are: professionalised its research and innovation activities, 42%; get involved in research with a longer 'time-to-market', 41% ; conduct research and innovation more often, 38%; conduct research and innovation more regularly, 37%.

8.2 Recommendations

The recommendations made are of course linked to the findings presented and discussed in Chapter 7 and in Section 8.1. Some of the recommendations made are relevant for both programmes similar to the Cooperation Programme and similar to the Research for the benefit of SMEs schemes. Some are only relevant for one of the two, or even for a part of it, e.g. focussing only on the role of SME associations in future R&D and innovation support measures similar to Research for the benefit of SMEs associations scheme.

It is of course important to note that FP7 was running from 2007-2013 and no new FP7 projects will be started anymore. However the conclusions and recommendations presented in this report are lessons learned from recently finished projects that were assessed in this Interim Evaluation of FP7. A considerable number of projects are still running and will be finished in the next few years. However, some recommendations will also be relevant when implementing future R&D and Innovation support measures. Some elements of three of the recommendations presented below are still useful for managing ongoing FP projects in the next few years, i.e.:

- policy officers should keep in touch with other partners in the project than just the coordinator (see recommendation 4 below);
- support should focus more on commercialisation (see recommendation 5 below);
- support should be provided to SME associations in managing projects (see recommendation 6 below).

In addition it should be realised that a substantial part of the total FP7 project portfolio will conclude one or two years after the launch of H2020 (running from 2014-2020). This presents a risk to the programme's ultimate value as officials and the more active participants switch focus to the new programme. This may result in a loss of momentum, and we have seen from our research here that project success (and impact) is contingent on the commitment of the project leadership / partners to exploitation.

Hence we also recommend that DG RTD / the Research Executive Agency (REA) seek to protect the staff and capacity sufficiently to maintain an active 'client' interest in this long tail of FP7 projects, pushing for high quality deliverables, end-of-project events and exploring opportunities for follow-on advice or financial support to strengthen commercialisation.

There remains a question about the extent to which the Commission's communication efforts are effective in reaching the full extent of potential SME participants. The number of applicants and participants accounts for a few percent of the total research and innovation active SME population. It is however unknown if the missing large majority are not applying because they don't know enough about the programme or because they have decided there are better and/or more relevant forms of support available elsewhere. However some of the trade and industry associations were reluctant contributors to the stakeholder interviews, and where we secured interviews, they had a rather limited view of the programme and a somewhat negative view of the FP's relevance to their SME members.
So we also recommend the Commission to conduct further research into the effectiveness of the various communication activities, as a minimum including additional questions within the annual NCP survey that is currently reported in the annual monitoring report.

The texts describing the six recommendations below each have a similar structure:

- the recommendations itself (*put in italic*);
- the story behind it (substantiation);
- specific actions that might be considered.

Recommendation 1 - Develop overall SME support strategy with clear distinctions between different SME target groups

Retain the SME quota within any future EU applied research programme, as it forces the wider community to recognise the contribution SMEs can make and it contributes to the competitiveness and growth of SMEs. In addition a specific SME strategy should be developed making a distinction between different target groups of SMEs which acknowledges the different technological positions and different contributions various types of SME can make.

Substantiation

If the Commission wishes a programme such as the Cooperation Programme in FP7 to be an SME programme, as opposed to a programme that is open to SMEs; then an SME-specific strategy is needed for the programme overall and for each thematic area. It is conceivable that certain thematic areas might better allow SME participation, hence the share of SME objectives set need to vary among thematic areas to maximise support to improve the research and innovation performance of SMEs in Europe. In such an SME strategy different types of potential SME participants need to be distinguished and their characteristics need to be clearly described and registered. The Commission should better define the target group of the programme, i.e. the type of SMEs being the target group for specific elements of the programme. It should be ensured that this is adequately considered in the implementation of such programmes, e.g. in assessing proposals and the consortia behind it. Different roles that may be distinguished for different type of SMEs are for example:

- SMEs being instrumental or at least contributing to achieving technological objectives formulated (as in the ten thematic areas in the Cooperation Programme). These SMEs are admitted mainly because they can contribute to achieving specific goals such as addressing European social, economic and environmental challenges.
- Specific smaller firms may be more innovative than larger firms and more inclined to pursue radical innovations. The literature suggests that these more radical developments have a greater likelihood of transforming economic performance or seeding new economic sectors and so contributing more strongly to longer-term improvements in productivity and competitiveness. Such SMEs developing disruptive technologies deserve public support because such developments may result in these SMEs becoming new, large international companies.
- Other parts of the SME strategy may not contribute much to advancing the technological frontier but may contribute to the EU business community at large keeping up with international competition and where possible improving its competitive position. These parts will not mainly focus on societal goals such as public health or other issues but look at innovation at the level of the firm to keep European industry competitive.

Specific actions that might be taken

1. Develop a proper definition of the type of SMEs that is considered to be the target group of a specific measure. A substantial proportion of participants registered in FP7 as SMEs are consultancies and private technology centres, whereas the primary beneficiaries of public support for SMEs, especially in the Research for the benefit of SMEs schemes, are meant to be SMEs that are participating to solve any issues with regard their own manufacturing or service process (production processes or products to be marketed). The Commission's monitoring data do not easily reveal the split between consultants[191] and other SMEs, so this classification should be improved. The Commission should define in advance which type of SMEs would qualify to receive the support offered and monitor this closely, i.e. to differentiate between RTD performers, RTD service providers, consultants, end-users, manufacturers, traders, technology providers etc.
2. Define different target groups within the SME population and relate specific programme objectives (for example within thematic priorities) to these target groups.
3. For some parts of the programme, really put the focus on non-R&D performing SMEs, when selecting consortia for funding, in order to increase effectiveness of the programme (e.g. to reach specific objectives as making more SMEs oriented towards innovation).
4. Especially firms new to future R&D and Innovation support measures might struggle to grasp the goals and rules, so a translation of formal texts into more business friendly language is useful to communicate with the wider business community in Europe that is not yet participating. This to assure a sufficiently high inflow of newcomers. Such efforts are important to avoid that the system develops into a 'closed shop', i.e. only regular participants reacting adequately on calls for proposals as they know the system and the procedures required.
5. Clearly monitor the share of first time participants among SMEs. Not only classify participants adequately but also monitor the shares of the budgets that go to projects in which SMEs are involved that participate for the first time in an EC funded R&D project (newcomers) and to SMEs that have participated earlier in an EC funded project. A maximum might be specified for the share of participants that are not newcomers and the share of budget that is allocated to them to avoid the programme developing into a closed shop.

Recommendation 2 - Collect more information to properly assess type of SME and improve monitoring

The Commission should register various characteristics of participating SMEs that are relevant for future R&D and Innovation support measures such as size, innovation and export performance (as well as growth of these) right from the application phase to assure that the proper target groups are reached.

Substantiation

It appears from this evaluation that the Commission does not know exactly what kind of participants are applying for a project. Only after approval some information becomes available. However useful statistics on size, innovation and exports are lacking. To judge whether the right target groups are actually reached and to know what the characteristics of these participants are, it would be very useful to have such information from the application phase and a couple of years before.

[191] It is important to distinguish between different types of consultants. One group are for example project management firms that specialise in coordination of FP projects. Another group are (technical) consultants and engineering design firms. They are knowledge-intensive business services (KIBS) and certainly may contribute to innovations.

Specific actions that might be taken

The Commission should monitor and register such characteristics in order to fully understand which SMEs could actually achieve which impacts (e.g. SMEs with the intention to grow vs. SMEs that "only" live on funding with no intention to grow; see also Recommendation 1).

1. In the application procedure some basis statistics on the category 'Private for profit', i.e. private commercial (PRC) enterprise / SMEs, of the last year and three years before should be requested, e.g.:
   - number of employees;
   - turnover;
   - export percentage;
   - R&D-expenses;
   - % of FTE's or staff time allocated to product and process development;
   - % of turnover obtained with products brought on the market in the last 3 years.
2. Enterprises might also be requested to provide such data during and after the closure of the project to provide useful input for monitoring, for example after 2 and after 5 years. It must be noted however that the developments registered cannot simply be attributed to participating in future R&D and Innovation support measures. Additional efforts are needed to assess the contributions made by the support programmes Such as creating adequate control groups etc.

Recommendation 3 - Develop objectives that are more SMART, i.e. Specific, Measurable, Attainable, Relevant and Time-based

Clear and concrete ideas should be developed with regard to what constitutes a success or failure of a future R&D and Innovation support measure with regard to SME issues. SMART objectives should be carefully developed in accordance with these ideas so that stakeholders at various levels as well as SMEs themselves are clear on what is to be achieved by the programme and agree on it.

Substantiation

Clearly formulated objectives are a pre-requisite for evaluating any kind of policy measure and usually lead to a more focussed design and implementation of the respective programmes (e.g. clearer communication of programme objectives, more targeted support actions, more focussed participation criteria, specific project selection criteria etc.). This evaluation showed that the objectives of the Cooperation Programme as well as the Research for the benefit of SMEs initiative are formulated in a rather general way, making a detailed assessment whether they have been reached or not rather difficult. Also a clear link between the hierarchy of objectives and the implementation of respective support actions and programme criteria is missing.

Clear and concrete ideas should be developed with regard to what constitutes a success or failure of a programme related to the respective SME issue and the different SMEs target groups. The specific objectives should be carefully developed in accordance with these ideas so that decision-makers on EU as well as on Member State level, NCPs, programme managers on national and regional level, evaluators and, not least, the beneficiaries (participating SMEs and/or other addressees of the programme) are clear on what is to be achieved by a programme and agree on it. Based on these objectives a clear hierarchy of objectives should be deviated building the basis for the definition of specific actions and respective criteria for participation in the programmes as well as for selection of the respective projects to be funded. In this way it will not only allow better monitoring and evaluation afterwards but also be instrumental in designing and implementing actions and criteria that are properly

focussed and thus make the programmes work better with respect to the impacts and effects intended to be achieved.
Presently this is not the case with the Cooperation Programme and the Research for the benefit of SMEs initiative, where the published goals cannot be described as Specific, Measurable, Attainable, Relevant and Time-based and thus no specific link can be established between the objectives of the programmes, their sub-objectives, the actions to be taken to reach these objectives and the respective programme and project selection criteria..

Specific actions that might be taken

1. Quantify objectives to a reasonable extent (e.g. as done within the Cooperation Programme: a target of 15% of EC contributions going to SMEs). To a reasonable extent, because it is not necessarily useful in every case. Formulating a great number of very comprehensive objectives is not useful either; "goal overload" should be avoided.
2. Clearly formulated objectives should include both strategic and operationalised aims. In case of more objectives, as in the initiatives evaluated in this Interim Evaluation, the relation among the different objectives should be clearly defined so that they form an integrated and transparent system or hierarchy of objectives.
3. Based on this integrated and transparent system/hierarchy of objectives specific actions and criteria shall be derived, ensuring, that programmes are implemented in an efficient and effective way, thus, contributing to reaching their respective objectives and the intended impacts.
4. Indicators for monitoring and evaluation derived from this system of objectives can subsequently be formulated, in order to ensure effectiveness and efficiency of the programmes will be evaluated in a proper way.

Recommendation 4 - Assure better insight in actual role of SMEs within the projects (are they in the driver's seat?)

The Commission needs to address situations, such as those in the Research for the benefit of SME initiative, where SMEs are not in the driver's seat - as intended by the programme - but taken on board by RTOs only after the proposal has already been developed. More efforts should be made to assure that the official registrations are in line with the actual situation: are SME (associations) actually in the driver's seat?

Substantiation

We know from eCORDA data[192], that one out of ten Cooperation projects is coordinated by an SME, and in 66% of the projects in Research for the benefit of SMEs an SME fulfils the role of coordinator. However, more qualitative research show that only 12% of the latter claimed they initiated the project and another 23% were at least part of a joint decision making process[193]. Case studies show that SMEs subcontracting RTOs ideally allow SMEs to define their needs however, if the RTO took the initiative, this is often not the case. Rather often, SMEs complain that they cannot efficiently impose their needs and requirements on RTOs, who finally dominate the research project. The picture is different with RSME projects that are initiated and dominated by strong and innovation based SMEs. For them, the programme design is optimal, and most efficient, as they can perfectly tailor their demand and can easily access knowledge provided by RTOs. Cases where RTOs invited SMEs to participate do at first glance not correspond to programme

[192] See Figure 3.7 in Section 3.2.3 and Section 5.2.3
[193] See Section 5.2.3

objectives in so far as the Research for SMEs scheme should give a better chance to SMEs to pursue their own innovation goals. At second glance, it still appears that also in these cases, SMEs might considerably benefit and increase their innovativeness further, as they gain in confidence and visibility related to their capacities.

For many RTOs in Europe the funds from FP7 and *a* future R&D and Innovation support measures are a major source of income. Several of these organisations participate in a very large number of projects, and no doubt they contribute a lot. However as noted, there are also side effects. These RTOs monitor closely the calls for proposals and see whether they can implement research activities in the field requested. For thematic calls in the Cooperation Programme this chain of events was more justifiable than in the Research for the benefit of SME schemes in the Capacities Programme. Research for SMEs projects in future should be focused on solving specific medium-term technological issues for (small groups of) SMEs. Similarly, the Research for SME associations scheme is meant to address technological issues for larger numbers of SMEs (organised in an association) in specific industries or segments of the value chain.
In quite a number of cases RTOs developed a proposal for these schemes and only at a rather late stage start identifying SMEs and SME associations to invite them to join. In many cases these projects still address actual problems of a (large) group of SMEs, but this chain of events is not as intended. The budget registration subsequently shows that a substantial part of EC funds goes to SMEs and/or SME associations. But in reality this money 'remains' to a large extent with the RTOs who took the initiative and play a major role in the implementation. It has to be avoided that RTOs - who often play a major role - have not their own commercial and/or research interests dominate the project.

Specific actions that might be taken

1. The Commission might address such situations by adjusting financial procedures, i.e. pay money to each participant directly and not via the project coordinator[194] (just as was done before FP7). This could have two effects: a) The financial viability check is mostly feasible for an SME when only being a partner, however the financial viability check while being a coordinator is often not feasible given the present rules. A small company may not get the securities - a bank guarantee - for the total project budget. Hence this measure would make it more feasible and more attractive for SMEs to be coordinator; b) If in the RSME schemes, SMEs actually receive the budget allocated to them although this money will be spent to outsource R&D to RTOs eventually; they have more possibilities to assure that efforts of RTOs are indeed focussed on the needs of SMEs in line with the objectives of the RSME schemes. If a project is initiated and coordinated by an RTO, and an SME in practice only gets a small part of the budget formally allocated to the enterprises because the major part is retained by the RTO to finance research implemented, the active interest and involvement of that SMEs and the power to influence the course of events might be much smaller.
2. The Commission and evaluators of the applications should look more closely at project proposals (and contract negotiations) to assure that the SME participants are appropriately engaged in the planned project, and that they remain content with this partnership construction over time. At the application stage and at particular intervals, the partners in the project should be asked about their (envisaged) role in the project and satisfaction with the progress and results of

[194] Not only the money but also the communication with the EC goes via the project coordinator. All partners should be automatically informed about official steps such as amendment request, submission of reports etc.

the project. This could reduce the risk that for example an SME has a formal role of coordinator, but that in reality they are not in the driver's seat.

3. The coordinator of the project has a communication monopoly with the policy officer. This means that partners often don't know what is going on in the project, e.g. whether a report has been submitted or an amendment been requested. A more active communication with partners in the consortium will be useful.

Recommendation 5 - Include more instruments for commercialisation of project results

For SMEs return-on-investment is crucial for their economic well-being and also for European R&D and Innovation support measures *commercial aspects are highly relevant. Therefore the need to support the exploitation of results obtained, especially by SMEs is apparent and should be encouraged in future R&D and Innovation support measures of the Commission.*

Substantiation

Although the analyses of economic impacts following companies' participation in either of the two initiatives showed that in most cases a variety of such effects was achieved, direct commercialisation (i.e. achieved almost immediately after the project in question ended) is apparently the exception rather than the rule. Only limited time has passed since the projects were concluded. The time-to-market not being fully covered by this interim evaluation (which is, at least in theory, shorter for the type of research conducted in Research for the benefit of SMEs) is certainly one of the major reasons for the apparent lack of tangible commercial/economic impacts. However, there are still a number of elements worth being considered as parts of a re-designed support programme. The complexity and inherent risks of the processes needed to achieve a full commercial exploitation of research results limit the respective success already now. Despite the fact that both timing and a general uncertainty of commercial success need to be taken into account, it is vital to understand that especially for SMEs a direct or at least short-term return-on-investment is crucial for their economic well-being. However, transforming research results into successful products or services requires additional activities, knowledge, strategic behaviour, financial efforts etc. The results of this Interim Evaluation confirm that SMEs are able and equipped for the commercialisation to varying degrees and furthermore, are often impaired by their role, activities and level of engagement in the projects. Quite often SMEs have a limited role in the project that they cannot influence or change themselves.

Since commercial aspects of R&D, as the objectives of an increased European competitiveness, more jobs in high-technology and high growth sectors etc. are highly relevant for future R&D and Innovation support measures, the need to support the respective exploitation especially by SMEs is apparent.

Specific actions that might be taken

In order to facilitate/ accelerate the commercialisation of project results in future R&D and Innovation support measures, a number of improvements and changes are suggested:

1. Extended and updated PUDK should be made mandatory. Project consortia are required to develop so called Plans for Using and Disseminating the Knowledge (PUDK). However, these often do not reflect the real-world complexity of the commercialisation processes, are of mixed overall quality, do not serve as guidelines/rules of action, are not updated, not tested, not tuned in to the potential markets, miss to include different strategies for all partners included etc. Therefore, the PUDK should be extended to reflect the reality of commercialisation

processes and the different commercial interests of the project partners. Updates and adhering to the PUDK should be made mandatory. In order to further facilitate the development and use of such a strategic document, the Commission should provide and apply a quality standard.

2. Carry out adequate market research. Commercialisation of research results tends to be most successful, prompt and effective whenever there is knowledge and information about the whole variety of potential markets, customers and applications. However, such knowledge is often limited by the necessary focus on certain (known) markets at one point in time (e.g. at start of project) or customers participating in the projects (who tend to steer the project into their own favoured direction leaving no room for alternative marketing strategies, applications etc.). In order to avoid failure or unnecessary limitations of any commercial exploitation activities the European Commission could appoint an external expert providing market knowledge to the project, or oblige the consortium to do so. Especially for SMEs, the respective costs could be funded as part of the EC contribution.
3. Include external expertise on regulation and standardisation. With SMEs' comparably limited market power, standardization and regulation often prove to be decisive elements in strategies to achieve commercialisation. However, SMEs (but not only SMEs) are often not aware of such processes or do not have access to it. With the help of the Commission services, especially the project officers, the project participants' activities should be connected to any relevant development in regulation or standardization. Monitoring these processes will likely have to be done by external experts.

Recommendation 6 - Set up support structure for SME associations

SME associations typically represent their members' interests in the economy. They might have limited capacity and capability to lead Research and Technology Development (RTD) projects. Their natural role is the dissemination of project results and communicating their members' needs to the consortium. In order for SME associations to be in the driver's seat, as specified by programme objectives, and to safeguard their members' interests, it is essential that SME associations should be involved in the development of the project idea and influence project progress. To address the generally limited capacity and capability of associations to actually manage RTD projects and to handle Intellectual Property Rights (IPR) issues, specific support should be provided in future projects that are similar to RSME projects.

Substantiation

One should be realistic with regard to the role most SME associations are able to play within the Research for SME associations scheme. Many SME associations do not have the capabilities and the capacities to actual manage an extensive R&D project or the application for IPR.[195] By default, IPR originating from the project belongs to SME associations but they are not the right organisations to use and exploit IPR. Enterprises on the contrary, are the ones with the resources to do so, but they must first obtain the property rights from the participating associations, after reaching an agreement. Very often, the person within the association who needs to take the final decision on these results does not reach a final decision on the industrial exploitation because it is not part of his or her duties. Meanwhile,

[195] See also the European IPR Helpdesk, http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=7272&lang=en&tpa_id=0&displayType=news&nl_id=1035.

participating SMEs who might be interested in commercially exploiting these results, cannot do anything.
In future projects that are similar to RSME projects, the Commission should ensure that the associations' role is realistically defined and that they are indeed in the drivers' seat when defining the project, ruling out the capture of the project by RTOs (See also recommendation 4).

Specific actions that might be taken

To support associations in performing the roles that the programme expects them to have the following actions could be considered:

1. Include management consultancies in the consortia to support associations with managing the overall project.
2. Include technology transfer organisations in the consortia. Association projects have a tendency to 'get stuck' between prototype development and market implementation. In order to alleviate this problem, the Commission might consider including technology transfer organisations in RSME association projects. While associations may not have the right know-how and expertise to see to it that project results get implemented on the market, technology transfer organisations do. Their involvement may facilitate project results reaching the market, so that a broader range of SMEs can benefit from the results of an association project.
3. Provide assistance with IPR application and management. It should be ascertained that other partners in the consortium/members of the association can use knowledge and technologies developed in the project. Otherwise the fact that the final beneficiary of the results of a project is the own industry association remains a weakness in the scheme Research for SME associations.

8.3 Concluding remarks

It is of course important to note that FP7 was running from 2007-2013 and no new FP7 projects will be started anymore. However the conclusions and recommendations presented in this report are lessons from the Interim Evaluation of FP7. Some recommendations might be considered when implementing future R&D and Innovation support measures, but some elements of the recommendations presented above are still useful for ongoing FP projects in the next 2 or 3 years, i.e.:

- policy officers to keep in touch with other partners in the project than just the coordinator (see recommendation 4 below);
- support commercialisation (see recommendation 5 below);
- support for SME associations in managing projects (see recommendation 6 below).

In addition it should be realised that the fact that a substantial part of the total FP7 project portfolio will conclude one or two years after the launch of H2020 (running from 2014-2020). This presents a risk to the programme's ultimate value as officials and the more active participants switch focus to the new programme. This may result in a loss of momentum, and we have seen from our research here that project success (and impact) is contingent on the commitment of the project leadership / partners to exploitation.
Hence we also recommend that DG RTD / the Research Executive Agency (REA) seek to protect the staff and capacity sufficient to maintain an active 'client' interest in this long tail of FP7 projects, pushing for high quality deliverables, end-of-project events and exploring opportunities for follow-on advice or financial support to strengthen commercialisation.

There remains a question about the extent to which the Commission's communication efforts are effective in reaching the full extent of potential SME participants. The number of applicants and participants accounts for a few percent of the total research and innovation active SME population. It is however unknown, if the missing large majority are not applying because they don't know enough about the programme and/or because they have decided there are better or more relevant forms of support available elsewhere. However some of the trade and industry associations were reluctant contributors to the stakeholder interviews, and where we secured interviews, they had a rather limited view of the programme and a somewhat negative view of the FP's relevance to their SME members.

So we also recommend the Commission to conduct further research into the effectiveness of the various communication activities, as a minimum including additional questions within the annual NCP survey that is currently reported in the annual monitoring report.

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Appendix 1 Glossary taken from 'Evaluating EU Activities, a practical guide for the Commission services'

The implementation of a policy measure (strategy) depends firstly on the mobilisation of sufficient and appropriate resources (or inputs) that are used to supply outputs, and secondly where relevant on the demand for these outputs from addressees. However, the focus of an evaluation is by definition mainly on the effects of an intervention on target areas/populations and whether these effects:

- *correspond with objectives (**efficiency**);*
- *are achieved at reasonable cost (**efficiency**);*
- *are likely to continue into the future in the absence of assistance (**sustainability**)*

On the basis of the evaluation results, the evaluation function should provide an independent opinion on the relevance, consistency, economy, efficiency, effectiveness, added value and sustainability of the policy, programme or activity evaluated in the light of its objectives.

The following definitions are provided (in alphabetical order):

Counterfactual situation

The situation, which would have arisen had the intervention not taken place. In order to derive the counterfactual situation we need an evaluation design. Except for the theoretical case of the ideal experimental design, we can never know the counterfactual situation with certainty. Real world evaluation designs tend to be based on an estimate of the counterfactual derived either from comparing subjects who were exposed to an intervention with a comparison group who were not exposed, or from examining subjects before and after exposure.

Deadweight

Deadweight is defined as effects, which would have arisen even if the intervention had not taken place. Deadweight usually arises as a result of inadequate delivery mechanisms, which fail to target the intervention's intended beneficiaries sufficiently well. As a result, other individuals and groups who are not included in the target population end up as recipients of benefits produced by the intervention. Deadweight is really a special case of programme inefficiency.

Effectiveness

The extent to which objectives set are achieved.

Efficiency

The extent to which the desired effects are achieved at a reasonable cost.

Global objectives

Provide a basis for assessing an intervention in relation to longer term and more diffuse effects (or global impacts). Indicators at this level are also called impact indicators.

How economically have the resources used been converted into effects?

In addition to ascertaining if an intervention has attained its objectives, it must also be assessed on the basis of how much it cost to attain them. Hence an assessment of the *efficiency* of intervention is required.

Impacts
A general term used to describe the effects of an intervention on society. Impacts can be either positive or negative and foreseen or unforeseen. Initial impacts are called results, whilst longer-term impacts are called outcomes.

Inputs
The human and financial resources involved in the implementation of an intervention.

Intermediate objectives
Provide a basis for assessing an intervention in relation to its short to medium-term effects (or intermediate impacts) on both direct and indirect beneficiaries/recipients of assistance. Indicators at this level are called impact indicators.

Intervention logic
The conceptual link from an intervention's inputs to the production of its outputs and, subsequently, to its impacts on society in terms of results and outcomes. The examination of the programme's intervention logic will be of central importance in most evaluations. The evaluator needs to ask how the programme achieves its specific objectives, and how do the specific objectives contribute to the attainment of the general objectives? The terms "theory of action", "programme logic" and "programme theory" are sometimes used to mean more or less the same thing.

Operational objectives
Provide a basis for assessing an intervention in relation to its ***outputs***. The latter can be defined as what is directly produced/supplied through the implementation process. Indicators at this level are called output indicators.

Outcomes
The longer-term impact, usually expressed in terms of broad socio-economic consequences, which can be attributed to an intervention (e.g. a reduction in the number of long-term unemployed).

Outputs
The goods and services produced by an intervention (e.g. training courses, prototypes, publications).

Relevance
The extent to which an intervention's objectives are pertinent to needs problems and issues to be addressed. If the objectives of an intervention indeed address the needs, problems and/or issues identified, the intervention strategy can be judged as respecting this criterion.

Specific objectives
Provide a basis for assessing an intervention in relation to the short-term results that occur at the level of direct beneficiaries/recipients of assistance. Indicators at this level are called results indicators.

Source: Mainly from Annex I: GLOSSARY of 'Evaluating EU Activities, a practical guide for the Commission services', July 2004.
See: http://ec.europa.eu/dgs/secretariat_general/evaluation/docs/eval_activities_en.pdf).

Appendix 2 Abbreviations used

BERD	Business enterprise expenditure on R&D
CIP	Competitiveness and Innovation Framework Programme of the European Union, run by DG Enterprise and Industry
DG RTD	Directorate-General for Research and Innovation
DID	Difference-in-difference method (not only consider performance improvements of SMEs participating in FP7 projects, but compare these improvements over the period before and after participation with developments within the control group)
EAV	European Added Value
EC	European Commission
EEN	The Enterprise Europe Network set up by the EC to assist small business, see: http://een.ec.europa.eu
ERA	European Research Area
ERC	European Research Council
EU	European Union, since 1-7-2013 28 Member States
EVCA	European Private Equity and Venture Capital Association
FP7	The Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013), its legal basis being Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006
GERD	Gross domestic expenditure on R&D
GovERD	Government expenditure on R&D
GVA	Gross Value Added
Horizon 2020	From 2014 onwards, Horizon 2020 will be the most important European programme for research and development, the successor of FP7.The budget for the new programme is € 80 000 million for seven years, compared to € 50 000 million for FP7 (also 7 years), an increase of 60%
ICT	Information and Communication Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
IPTS	Institute for Prospective Technological Studies
KIBS	Knowledge-intensive business services
KPI	Key Performance Indicators
MS	EU Member States
NCP	National Contact Points (NCP are providing information and advice in relation to the EU RTD programmes in national languages)
NMP	Nano sciences, nanotechnologies, materials and new production technologies
PRC	Private commercial organisation (category of participants in eCORDA dataset)
PSM	Propensity Score Matching, technique to create a control group composed of individual SMEs that are as much as possible similar to the SMEs that participated in an FP7 project
PUDK	Plans for Using and Disseminating Knowledge
R&D	Research & Development
RDTI	Research, Development, Technology and Innovation
REA	Research Executive Agency, a funding body created by the European Commission to foster excellence in research and innovation http://ec.europa.eu/rea

RSME	Research for the benefit of SME scheme, within in the FP7 Capacities Programme
RTD	Research and Technology Development (see also DG RTD)
RTO	Research & Technology Organization
SMART	Specific, Measurable, Attainable, Relevant and Time-based (objectives)
SME	Small and Medium sized Enterprises (EU definition has several criteria a.o. less than 250 employees, see: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/
VC	Venture capital, financial capital provided to early-stage, high-potential, high risk, growth start up companies
SSH	Socio-economic sciences and the humanities
TTG	Time to grant, time elapsed between the deadline of a given call and signing of the grant agreement in FP7

Appendix 3 Overview tables for 7 evaluation aspects

Table A3.1 Overview findings per programme with regard to relevance

Cooperation Programme	*Research for the benefit of SMEs initiative (RSME)*
Programme is relevant for SMEs	Schemes are relevant for SMEs
Participating SMEs are well aware of the objectives of the programme.	The majority of SMEs funded by the Research for SMEs scheme know very well what the scheme's objectives are. In RSME, SMEs are even a bit more aware of the objectives, which might be related to the fact that the Capacities Programme uses more concrete, well defined objectives in their programme documents than the Cooperation Programme.
Most of the objectives are not really formulated SMART.	Most of the objectives are not really formulated SMART.
The Cooperation Programme fits rather well to the needs and priorities of the SMEs. However, it seems to fit best to SMEs that are relatively innovative and already engaged in R&D.	Although the schemes responds rather well to the needs and priorities of the SMEs some critical issues also emerge: RSME projects may actually not be driven by SME associations but 'captured' by RTOs that may lack a proper understanding of the actual SME and market needs.
Communication seems to be a limiting factor in reaching out to a sufficient large part of the 20 million SMEs in Europe. National stakeholders like NCPs are putting in a lot of efforts to translate text from the Commission in a business friendly format to reach out to a large part of the SME community. However, much efficiency could be gained if this would not have been done in each country separately.	-

Source: Sections 3.1 and 5.1 of this report.

Table A3.2 Overview findings per programme with regard to effectiveness

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
Overall, the eCORDA database shows that 5% of all SME participations are in the role of coordinator, this results in 11% of all Cooperation projects having an SME as coordinator. However the percentage of SMEs that reports to have taken the initiative is higher (18%).	From among 4276 SME participations, 12% are in the role of coordinator. An SME fulfils the role of coordinator in 66% of all RSME projects. However, it also happens that SMEs are invited by RTOs to participate and to take a specific role, just to qualify for the criteria set by the programme. About one thirds of the SMEs were included in the initiation of the project.
In the period 2007-February 2013, in total 5 650 projects in have started with 11 952 SME participations (not unique SMEs as some SMEs participate in more projects) which is 18.5% of all participations. Most SMEs (73%) participate only once in the Cooperation Programme; 24% participates 2 to 5 times.	In the period 2007 - February 2013, 771 projects have been started. In total there are 6947 participations (not unique organisations as some participate in more projects) of which 4276, or 62% are SMEs.
18.5% of all participations are SME. The specific target of at least 15% of the budget should go to SMEs has been achieved: 16.3% go to SMEs.	62% of all participations in the Research for SMEs scheme are SMEs. These SMEs receive 88% of the funds available, it should however be noted that this money is subsequently mostly spent on research done by RTOs; in line with the design of the scheme.
The Cooperation Programme is delivering outputs that are relevant to the research and innovation ambitions of SMEs, and in this sense it is an effective programme.	Nearly 80% of the SMEs participating in Research for SMEs scheme state that this improved their ability to utilise external know-how and research infrastructure, one of the objectives of this scheme.
It is difficult to determine more precisely the extent to which the programme outputs have been achieved because as mentioned with 'relevance', most objectives are not formulated in a SMART fashion. In addition they are generally not SME focussed.	It is difficult to determine more precisely the extent to which the programme outputs have been achieved because as mentioned with 'relevance', most objectives are not formulated in a SMART fashion.
That SMEs are rather positive about the effects of the programme can also be derived from the fact that more than a quarter participate in more than one Cooperation project in FP7. SMEs show satisfaction with the effects of the Framework Programmes in general: participants have substantial experience with the Framework Programmes FP 4-7, only 30% have no previous experience.	Over 80% of the SMEs participate in only one project, nearly 17% in 2 to 5 projects and less than 1% in 6 or more projects.
Given that many participants are doing more projects; it is important to also pay attention to provide access to newcomers in communication, setting conditions etc.	

In general, intangible outcomes for SMEs are on average higher than tangible outcomes: the acquisition of technical knowledge; learning effects, how R&D projects should be managed; relations with new partners, networking and experience on an international level.	*A large majority of SMEs gained access to new knowledge and know-how. Solving a more concrete technological problem is less common. IPR was created by a minority of participants. Also in association cases, SMEs have produced many intangible outcomes like building networks and increase in knowledge.* In half of the association projects, the SME association acted as project coordinator. Practically all SME associations play an important role in the dissemination of project results. The RSME scheme is well conceived and delivering valuable additional support to innovative SMEs. The Research for associations projects typically produce demonstrators, prototypes or tools. However, quite often these outputs do not reach the market.

Source: Sections 3.2 and 5.2 of this report.

Table A3.3 Overview findings per programme with regard to efficiency

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
Effects identified are relatively often intangible ones (see above), partly because serious economic effects are most like to be measurable only several years after completion of the project, hence not within an interim evaluation.	Effects identified are relatively often intangible ones.
64% of the participating SMEs are of the opinion that the benefits of the Cooperation Programme outweighed the costs, 27% expect this to be realised in future and only 8% do not see this happening at all.	Only 43% of the SMEs stated that the benefits right away outweighed the costs, 42% expect this to be realised in future (so together still a large majority) and 14% do not expect the benefits to outweigh the costs at all.
Efficiency of the various implementation aspects studied. 'Time to payment' scores highest in the perception of SMEs: 20% very satisfactory and 38% satisfactory, a total of 58%. However this implies that 42% are not really satisfied and this is relatively important for SMEs that often face difficulties in pre-financing such activities.	Data on 'time-to-grant' show that it takes around 11 months on average from proposal submission to contract signature. This is quite long for a market-oriented scheme.
There is a generally positive view on the Cooperation Programme's efficiency as regards the nature and extent of the SME-related outputs being produced. However, this is based on a more qualitative understanding of projects producing numerous additional relationships, advances in understanding etc.	Still, the SMEs participating in the Research for SMEs scheme seem to be rather satisfied with the implementation of the scheme. The time-to-payment even ranks first with 56% of the participating SMEs being (very) satisfied. Still 44% are not satisfied and this might be relatively important for SMEs that struggle to get activities financed. Least satisfactory of 10 aspects assessed are the administrative requirements for applications in the view of the respondents.
The programme might still be improved. Where more than half of participating SMEs find several implementation aspects as time-to-payment, role scientific officer, quality of documents and guidelines satisfactory; only one third of all participating SMEs find the administrative requirements for applications satisfactory.	Although both SMEs and SME associations report often that project management was efficient and satisfying; there appear efficiency concerns in situations where no follow up is possible after the end of the project and products are not yet brought to market. Project benefits then tend to be mainly intangible, and projects might be regarded as rather expensive learning and networking exercises.
	A point that has to be questioned in terms of efficiency is the design of the Research for SMEs scheme with SMEs not receiving money for themselves, but funds to be paid to RTOs. The scheme seems to benefit the universities and RTO's more than the SMEs. Universities and RTOs frequently just find SMEs to partner up to qualify for the funding but often the SME does benefit relatively little from being involved. This practice where RTOs are developing project designs and only at a late stage get SMEs on board, is the opposite of the intention of the programme: start with focussing on actual R&D needs of SMEs.

Source: Sections 3.3 and 5.3 of this report.

Table A3.4 Overview findings per programme with regard to impacts

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
Growth rates for employment and operating revenue calculated for SMEs participating in the Cooperation Programme of FP7 were considerably higher than for SMEs in the control group.	The econometric results - although based on a relatively small number of observations - show that SME participants in Research for the benefit of SMEs had higher employment growth in the period 2006-2011 than the SMEs in the control group.
Also over a longer period of eight years - analyses made possible by considering FP6 projects - SMEs participating in the Framework Programmes had a considerably higher employment growth than non-participating SMEs in the control group over the same eight years.	
The long lasting effects reported by the SMEs are especial: the actual cooperation itself (more networking and deepened relations with research partners or customers, new contacts in relevant fields or business areas etc.), new knowledge linked to the research field investigated or the technology developed, as well as competences and capacities in innovation.	Asked about important long-lasting effects, the SMEs most often mention: increased/deepened or new collaborations with partners; increase in innovation-related competences and capacities; commercialisation and knowledge.
SMEs also frequently reported on positive reputational effects as a result of participation in an FP Cooperation project.	
It is not possible to fully assess the longer term impacts of the Cooperation Programme on the business performance of participating SMEs within this Interim Evaluation. The analyses show that from successful projects results have been delivered (e.g. prototypes), but that full commercialisation of these has not yet been completed and reflected in turnover, employment levels or profits.	
The perception of participating SMEs is that their competitiveness has improved (80% report improvement). For actual business performance scores are much lower: for profitability, turnover and employment: some 15 percentage points report at this moment in time a strong or rather strong improvement). An overall estimation of the percentage growth for these SMEs results in 22-28%.	Asked about the impacts of the FP7 project, SMEs rate increases in competitiveness rather high, followed by increases in productivity and profitability. Impacts on turnover and employment are rated lower. Those expecting an impact were asked about the size of this: results for turnover, employment and exports are estimated to be about +16%. There is an impact on commercial success of participating SMEs in almost a third of the association cases. However, in many cases the impact is limited to a subset of participating SMEs and most of the time the impact cannot be quantified in terms of employment, turnover, and profitability.
In most cases it is too early to determine the Cooperation Programmes concrete benefits to society due to innovative problem solving, but various challenges are indeed addressed by funded projects.	For almost 60% of association cases the impact of association projects on society is considered to be low or very low. This often means that so far there are hardly any impacts on society visible. Expected impacts on society are often of an environmental nature.

Source: Sections 4.1 and 6.1 of this report.

Table A3.5 Overview findings per programme with regard to EAV

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
There is some evidence for substantial EAV from the Cooperation Programme through its support for SMEs' research and innovation activities, which are subject to major market failures and attract limited public support in a majority of EU Member States.	The RSME's EAV is considered positive, as it operates at a scale and scope that the private sector does not come close to matching and provides the kind of support that does not exist in the great majority of EU Member States.
As it is still very unusual for SMEs to secure national funding for Cooperation projects with partners from abroad, a range of effects contribute to EAV, such as access to knowledge from abroad, and access to international markets.	
In some countries the SMEs motivation for participation in the Cooperation Programme was "access to financial assistance not available nationally or regionally" and as much as 74% of all participating SMEs state that the effects realised could not have been achieved in a national or regional funded programme or through private funds.	Two thirds of the SMEs participating in the Research for SMEs scheme state that the effects realised could not have been achieved in national or regional funded programmes or through privately financed research projects.
The following particularities of FP7 funding in the scope of the Cooperation Programme compared to national funding are relevant: scope and size of the project, access to knowledge and competencies on the international level and access to international markets and business partners.	Three types of EAV are distinguished in the assessment of EAV: a). Technological added value, namely the added value of a European project due to technical reasons like specialised knowledge, or equipment (high or very high in 60% of the projects analysed in more detail), b). Economic added value, namely the added value of a European project due to access to international customers, or markets (high or very high in nearly 30% of projects analysed), and c). The European funding is compensating a lack of alternative funding (high or very high in more than 70% of cases).
	The European Added Value of association projects is considered high to very high in 50 to over 70% of cases for the three dimensions of European Added Value distinguished.

Source: Sections 4.2 and 6.2 of this report.

Table A3.6 Overview findings per programme with regard to behavioural additionality

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
A significant part of SMEs state that they have changed their innovation behaviour and attitude due to their participation in the Cooperation Programme; they are now more aware of the potential benefits of research, do research more often or more regularly, cooperate more in innovation activities etc. and that is considered to be among the most long-lasting effects of their participation in the Cooperation Programme.	The following effects with regard to behavioural additionality can be asserted in the analyses: a) getting involved in collaborative research and innovation more often; b) professionalised research and innovation activities; c) getting involved in research with a longer 'time-to-market'; d) conduct research and innovation more often; e) conduct research and innovation more regularly.
However, most SMEs participating in the Cooperation Programme are already innovation oriented, so although the effect is there it is not often a turnaround effect for SMEs that are not involved in any R&D and innovation activities, yet	For the SME association scheme impact on associations' behaviour is considered to be low or very low in more than 60% of cases. Only 25% of the associations have changed their services to members and 30% have changed their cooperation and networking with other SME associations as a result of project participation.

Source: Sections 4.3 and 6.3 of this report.

Table A3.7 Overview findings per programme with regard to innovation

Cooperation	*Research for the benefit of SMEs initiative (RSME)*
There is some doubt on the extent to which the Cooperation Programme is helping SMEs to actually innovate.	The question whether the SMEs have become more innovative by participating in the RSME scheme, can be answered with "predominantly, yes",
However, considering that the majority of SMEs created new innovation-related partnerships and networks, became more aware of the potential benefits of innovation, became more professional in their innovation behaviour and managed to create innovations new to the market, it may be concluded that the majority of SMEs funded have indeed realised some innovation-related effects of their participation.	Because the majority of participating SMEs could: a) create new innovation-related partnerships and networks; b) become more aware of the potential benefits; c) act accordingly in terms of professionalization and other behavioural aspects; and d) managed to produce innovations new to the market[196].
The effects on innovation seem to be cumulative, i.e. each participation and its effects build upon previous participations and the respective effects. Thus, newcomers realise fewer or less strong effects with regard to their overall innovativeness than SMEs that participate in the Cooperation Programme more often	Similar to the Cooperation Programme, the effects of participation in the RSME initiative seem to be cumulative. Thus, SMEs that participated in other projects before realise stronger effects with regard to their overall innovativeness than newcomers.
	In about half of the association projects analysed, an impact on the innovative capacity of participating SMEs can be observed. However, there are also a number of cases where there is no impact on innovative capacity because the participating SMEs were innovative in the first place. Conversely, for other SMEs there was no impact on innovative capacity because they are far from being R&D oriented. In other words, they lacked the absorptive capacity to benefit from the project
	Association projects aim to render benefits for many of the SME members of the associations involved. Hence, it is imperative to look into how the association projects have benefited the wider SME community. However there is very little evidence that the association projects have led to an increase in innovative capacity in the wider SME community so far

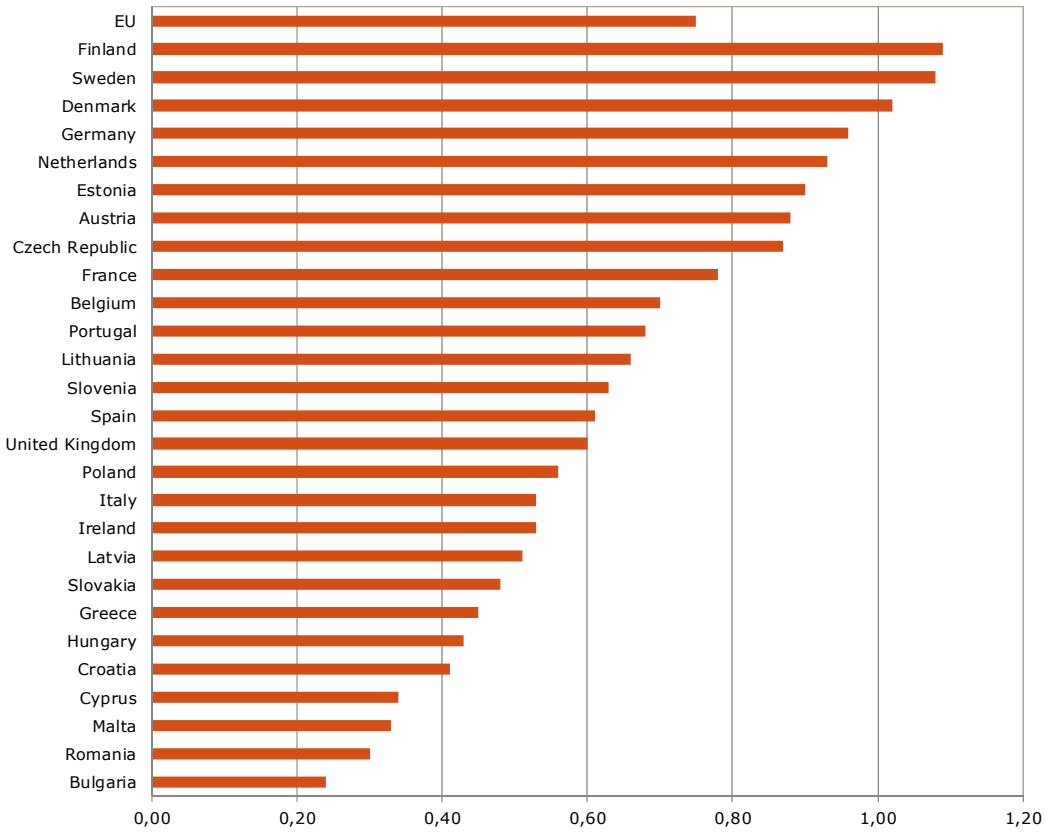
Source: Sections 4.4 and 6.4 of this report.

[196] From the case studies it became clear that often prototypes get developed but most often they do not reach the market during or in a period of 1-3 years after completion of the project (not commercialised yet).

Appendix 4 R&D Expenditure by Member State

Figure A4.1 presents an overview of public expenditure on R&D as a proportion of GDP for the EU and by EU Member State. Three points stand out, firstly that there is a broad spectrum between the higher and lower bounds, with Finland investing around five times more than Bulgaria in proportionate terms. The second is the skewedness towards the northern and western EU MS. Third, the great majority of EU MS fall some way short of the EU average, on this metric.

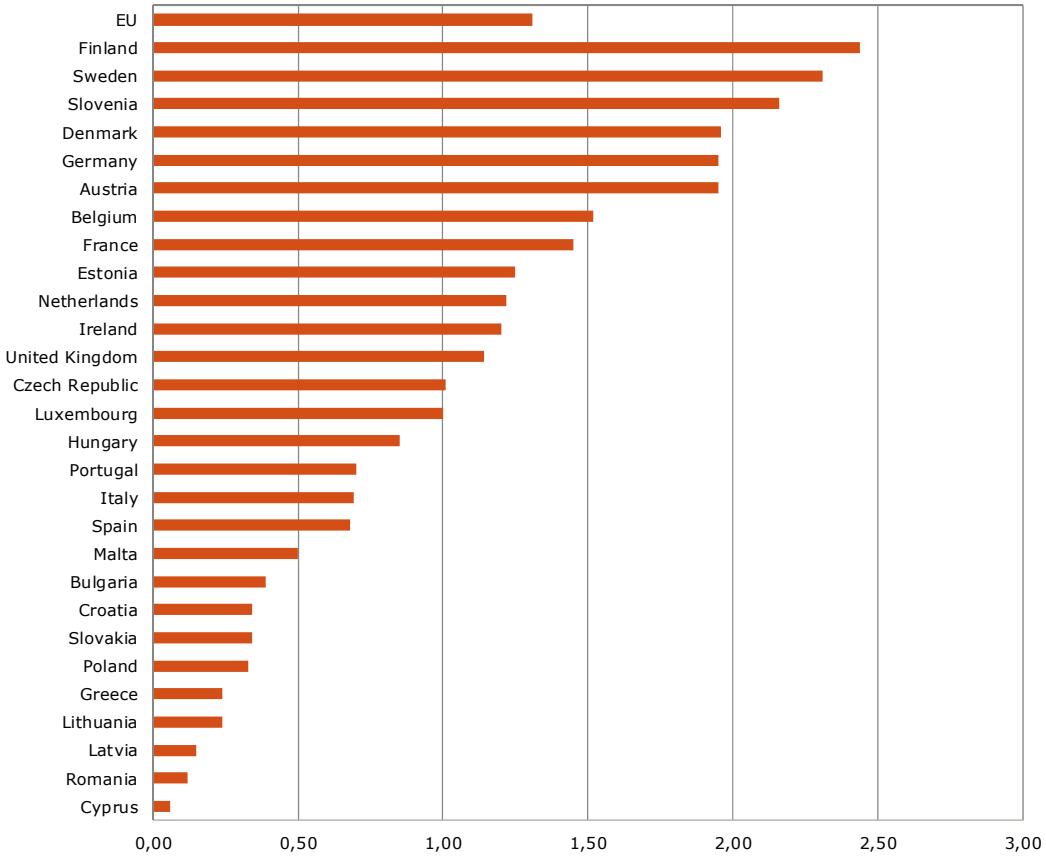
Figure A4.1 Public R&D expenditures as % of GDP (2012) by EU Member States



Source: Innovation Union Scoreboard 2014 (for Luxembourg no 2012 data available).

Figure A4.2 presents the same kind of analysis for BERD and reveals a similar geographical distribution, but a greater differential between the higher and lower bounds, with Finland's industry investing around 10 times the investments being made in Poland, Greece or Romania, in proportionate terms.

Figure A4.2 Business R&D expenditure as % of GDP (2012) by EU Member State



Source: Innovation Union Scoreboard 2014.

Appendix 5 Evolution of RTD Framework Programme's support to SMEs

The European RTD Framework Programmes have always sought to address European SMEs[197] in a general sense and the programme's specific support for SMEs has a long history too and can be traced back to the early 1990s, with the launch of FP3. This historical perspective provides a window onto the evolution in our understanding of the innovation needs of Europe's SMEs.

Table A4.1 summarises the key features of relevance to SMEs within successive FPs, from FP3 to Horizon 2020 (H2020), in order to reveal the evolution in thinking regarding the particular needs of SMEs and the sorts of constraints or market failures that affect them. It suggests the programme has learned over time and certainly shows the Commission's increasing commitment to ensuring its schemes are known to and relevant for a growing proportion of all of Europe's innovative SMEs.

The following paragraphs provide a brief narrative to draw a connection between these many and various developments and the programme's improving engagement with SMEs. Should readers wish to understand a little more about the earlier measures, the report of the previous SME impact assessment includes a more detailed elaboration of the various additions.[198]

The SME Specific Measures consisted of two parts: Exploratory Awards, open to SMEs irrespective of their existing R&D capability, to help them prepare complete research proposals; and Cooperative Research Action for Technology (CRAFT) projects for SMEs with little or no internal R&D capacity. CRAFT sought to promote the development of technologies adapted to the needs of SMEs through transnational cooperation amongst SMEs and research organisations. The object was to support SMEs articulate their technological needs and to improve their ability contribute to the development of those technologies and their adoption. CRAFT is the forerunner of the current FP7 RSME scheme.

The introduction of SME Specific Measures in FP4 increased SME participation rates[199], and led to the schemes being retained in FP5. FP5 also included Economic and Technological Intelligence actions (ETI) designed to address another classic SME problem wherein small firms' limited internal resources and market relationships will naturally limit the extent to which they are aware of broader technological or market developments.

The experience of FP4 also led to the introduction, with FP5, of several important refinements to the scheme and the creation of new accompanying measures. Those developments included:

- a network of SME National Contact Points[200];
- an SME information portal, TechWeb[201];
- a helpline to provide information, advice and assistance to SMEs;
- an Intellectual Property Rights (IPR) Helpdesk;
- an SME and Innovation Unit.

[197] Programme documentation of FP2 stated that a 'particular aim of R&TD shall be to strengthen the scientific and technological basis of European industry, including SMEs'.

[198] Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programmes for RTD, 2010.

[199] Already in FP4 SMEs represented 29% of all participants and received 21% of all research funding. Source: http://ec.europa.eu/research/sme/leaflets/en/02.html.

[200] Providers of information and guidance to SMEs wanting to participate in EU-funded research. Their role was strengthened throughout FP7.

[201] The SME TechWeb offers a range of information for SMEs that would like to take part in EU research. It is designed for technology-oriented companies wishing to innovate and internationalise. Using clear, simple language, offering numerous concrete examples of projects, this website will be of particular value to those applying for research funding.

FP5 also allowed SMEs to submit proposals at any time, on any topic (as long as it related to one of overall objectives of FP5), via a single entry point. Together, these changes resulted in an early and substantial response to FP5's open call for SME Specific Measures proposals.

FP6 saw the introduction of an indicative target for SME participation (10%) in the mainstream programme and a requirement for proposers to explain how they intend to involve SMEs or SME associations. Moreover, FP6 introduced SME-specific instruments (SME-STREP and SME-IP instruments) within the mainstream programme, in which SME participation was required to be at least 50%. It also introduced SME-dedicated calls and topics. Other SME relevant measures included Specific Support Actions (SSAs) with an objective to stimulate, encourage and facilitate the participation of SMEs.

FP7 saw introduction of the first target related to the overall FP Cooperation Programme budget. It stated that 15% of FP7 financial contribution would be directed to SMEs. Other changes from FP6 to FP7 meant that SMEs could receive 75% funding as opposed to 50%, that requirements for audit certificates have been reduced and no bank guarantees were obligatory (as they replaced by a guarantee fund to cover the risks of partners failing to complete their obligations). Furthermore, SME participants in FP7 could decide how to manage intellectual property through their consortium agreement, contribute to Joint Technology Initiatives (JTIs) and the technology-oriented and high-tech SME associations ensured representation in European Technology Platforms. FP7 also saw the launch of Eurostars (a joint programme with Eureka) and the Enterprise Europe Network (EEN). These changes and many already existing structures such as SME TechWeb, SME National Contact Points make it easier for SMEs to participate in the Framework Programme and make the programme more relevant to SMEs than ever.

Indications from both European Parliament and the European Council suggest that Horizon 2020 (H2020), the successor to FP7, will commit to invest an even greater proportion of the overall EU budget with SMEs. Among other things, there will be a new dedicated SME instrument that will, for the first time, allow single companies to receive funding. The SME instrument recognises the nature of the different challenges as businesses progress through the innovation lifecycle, moving from concept to commercialisation, and will offer assistance over 3 phases. The first phase, called Concept and Feasibility Assessment, similar to Exploratory Awards in FP4 and FP5, will comprise relatively small grants of up to € 50k to support feasibility studies of up to 6 months in duration. The second phase will fund development of prototypes and testing (output-based payments € 1m - € 2.5m) and the third phase will address commercialisation, where the role of the EC will change from investor to facilitator. This is an important new departure for the Commission, and addresses a concern that is widely expressed - including throughout this Interim Evaluation - about the post-project challenge of taking ideas to market. The Commission will try to support participants in crossing the so-called 'valley of death' by facilitating access to private finance via networking, training, coaching, knowledge sharing and dissemination. In addition to this new instrument, there will be a continuation of existing schemes such as SME participation in collaborative R&D projects, Eurostars, Europe INNOVA, Marie Sklodovska-Curie actions and Access to risk finance; but with a widened scope.

Table A5.1 Development of successive FPs' support to SMEs

	FP3 (1990-1994)	FP4 (1994-1998)	FP5 (1998-2002)	FP6 (2002-2006)	FP7 (2007-2013)	Horizon 2020 (2014-2020)
Relevant Scheme(s)	CRAFT actions implemented within the BRITE/EURAM II	Technology Stimulation Measures for SMEs: • Exploratory Awards • Cooperative Research (CRAFT)	The SME Specific Measures: • Exploratory Awards • Cooperative Research (CRAFT) Promotion of innovation and encouragement of SME participation	Specific Actions for SMEs: • Cooperative (SME) Research • Collective Research (SME associations) Projects Specific Support Actions: • Economic and Technological Intelligence (ETI) SME dedicated Calls (e.g. SME-STREPs and SME-IPs) SME dedicated calls and relevant topics in thematic programmes Possibility to join on-going projects Marie Curie Actions	Research for the benefit of SMEs and SME associations SME dedicated calls / topics within the Cooperation Programme Industry-Academia Partnerships and Pathways Marie Curie Actions Joint Technology Initiatives (JTIs) SBIR pilot Eurostars	SME instrument (SBIR model) used across all societal challenges as well as for the LEITs (Leadership in Enabling Industrial Technologies) Marie Skłodowska-Curie Actions Future and Emerging Technologies A dedicated activity for research-intensive SMEs in 'Innovation in SMEs' 'Access to risk finance' will have a strong SME focus (debt and equity facilities) Eurostars 2 Programme for the Competitiveness of enterprises and SMEs (COSME) 2014-2020 will be complementary to Horizon 2020

Specific Support structures			National Contact Points SME TechWeb IPR Helpdesk Other communication activities (e.g. workshops, publications, meetings, distribution of SME success stories, etc.)	National Contact Points SME TechWeb IPR Helpdesk Other communication activities	National Contact Points SME TechWeb IPR Helpdesk European Technology Platforms (ETP) Enterprise Europe Network (EEN) Other communication	National Contact Points? SME TechWeb? IPR Helpdesk?
Changes specific to SME participants **(Schemes and support actions)**		Introduction of Technology Stimulation Measures for SMEs implemented within each specific programme[202]	Creation of SME TechWeb Establishment of Intellectual Property Rights Helpdesk Introduction of Economic and Technological Intelligence	Launch of the Inter-service SME Task Force to focus on SME involvement Changes to evaluation criteria: For IP and STREP proposals, the proposers should clearly indicate how they intend to involve SMEs SMEs could participate in the new instruments in FP6 through SME Groupings or associations Introduction of SME relevant topics for calls in thematic programmes Possibility to join ongoing projects	Introduction of 15% budget target for SME The requirements for audit certificates have been reduced and no bank guarantees are obligatory (replaced by a guarantee fund to cover the risks of partners failing to complete their obligations) Participants can decide how to manage intellectual property through their consortium agreement (Improved IPR agreement flexibility) SMEs may contribute to Joint Technology Initiatives (JTIs) and Technology-oriented and high-tech SME associations are	Expected a minimum of 15% of the total budget for 'Tackling societal challenges' Specific Programme and the 'Leadership in enabling and industrial technologies' to go to SMEs Within the new SME instrument, single company support will be possible. Research will have a competitive market oriented EU dimension. It will be implemented over three phases: 1. Concept and Feasibility Assessment

[202] Telematics Applications; Industrial and Materials Technologies; Standards, Measurements and Testing; Environment and Climate; Marine Sciences and Technologies; Biotechnologies; Biomedicine and Health; Agriculture and Fisheries; Non-Nuclear Energy (R&D component, JOULE); and Transport.

				Pre-allocated budget for take-up measures	members of European Technology Platforms Eurostars - a Joint Programme addressing R&D performing high-tech SMEs with a total value of 400 million EUR over 6 years. Enterprise Europe Network is the largest information and consultancy network in Europe	2. Innovation R&D activities (Output-based payments €1-2.5m) 3. Commercialisation (No direct funding) Financial instruments funded by EC and EIF: Equity instrument for innovative SMEs (Seed, start-up, early stage, expansion

Sources:

1. http://ec.europa.eu/research/horizon2020/pdf/press/horizon2020-2. presentation.pdf.
2. Impact assessment of the SME-specific measures of the Fifth and Sixth Framework Programmes for Research on their SME target groups outsourcing research.
3. Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programmes for RTD.
4. Questions and answers on support for Small- and Medium-sized Enterprises (SMEs) in Horizon 2020- The EU Framework Programme for Research and Innovation.
5. Questions and answers on support for Small- and Medium-sized Enterprises (SMEs) in Horizon 2020- The EU Framework Programme for Research and Innovation.
6. The EuroSME 2013 Conference Presentation, The Future: Europe and Horizon 2020 - Bernd Reichert, European Commission.