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An Impact Assessment of R&D Funding Schemes

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Directorate-General for Research

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Luxembourg: Office for Official Publications of the European Communities, 2007
ISBN 92-79-04557-1

PRINTED ON WHITE CHLORINE-FREE PAPER

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IMPACT ASSESSMENT: A SURVEY OF SME-SPECIFIC RESEARCH SCHEMES

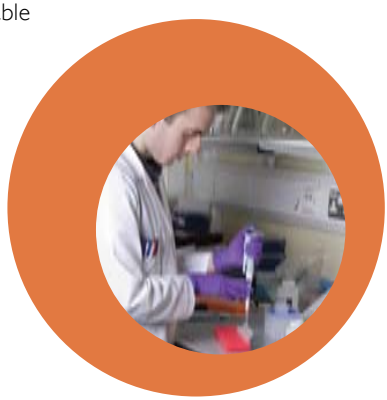
Introduction

Small and medium-sized enterprises (SMEs) are the lifeblood of Europe's economic landscape and while large multinational companies may get most of the media's attention, in fact they only represent a tiny sliver of the totality of companies operating within the greater European marketplace. SMEs are a key driver of innovation and technological development throughout the EU. If Europe is serious about developing an inclusive rather than an exclusive society, then continued support for those SMEs actively developing new products and services is essential.

SMEs possess unique characteristics that set them apart from larger companies on a number of different levels. By definition, SMEs view business and innovation differently than larger corporations, often lending fresh perspectives to scientific and technological R&D throughout the continent. SMEs, due in part to their limited size and resources, tend to adopt a different set of philosophies to those of larger entities and this can mean that the Commission may have to adopt a more flexible approach to policy formulation and funding programmes dedicated to SMEs.

Many large corporations produce the bulk of their revenue from tried and tested products that still generate large sums of money. Successful SMEs, on the other hand, are increasingly recognised for their innovative products and ideas. SMEs are often the creation of an individual or small group with a particularly innovative idea, and the dedication to bring it to fruition. The motivation behind a particular SME concept is often determined more by the initiator's passion for a particular idea than the achievement of the best possible bottom line. An obvious consequence of this deficiency in their ***raison d'être*** for those SMEs involved in high-risk research, is that they can run into difficulties securing sufficient capital to translate their ideas into marketable products.

The European Union has long understood the integral position SMEs hold within the European economy, and is constantly examining new ways to support their innovative activities and to foster a culture of cutting-edge R&D within SMEs. They have a vital role to play in the achievement of the Lisbon Agenda. European policymakers understand that in order to progress towards the stated goals for the European economy by 2010, SMEs must actively participate in innovative

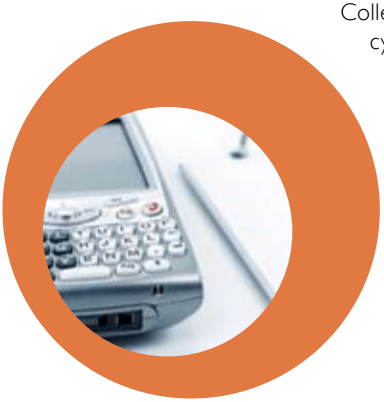


research, not just in niche areas that the large companies are unwilling to undertake. Small high-tech businesses tend to be one of the most important starting points for future large businesses and emerging economic sectors. SMEs have an increasing role in ensuring that Europe becomes a technology trendsetter across all sectors, from environmental protection to occupational health to trade. As such, the European Commission has placed great import on the continued success and vitality of SMEs, and has tailored specific funding schemes to fit their needs. Three such schemes are the **CRAFT/Co-operative Research programme, the Collective Research programme and the Economic and Technological Intelligence (ETI) support actions.**

To gain insight into the effects these schemes have upon SMEs and research institutions, DG Research commissioned an impact assessment of the way these schemes affected those who have taken part. This is the first time such an appraisal of SME-specific schemes has been conducted, and from it we can better understand how SMEs benefit while also identifying areas that merit fine-tuning. In a nutshell, each scheme has received an enthusiastic response, and participants have testified that these funding programmes are facilitating research initiatives that wouldn't otherwise have been undertaken. This booklet is designed to highlight the main findings of the impact assessment, and present a real life snapshot of the schemes through individual case studies.

Through each case study we are able to perceive how the idea for a particular project originated, how a consortium coalesced around the idea, executed their innovative solution and, finally, the impact the project had on the participants and the market they operate within.

Six case studies have been chosen – three Co-operative projects, two Collective projects and one ETI action – to illustrate project life cycles from beginning to end.



EUROPEAN FUNDING SCHEMES: A BRIEF OVERVIEW*

CRAFT/Co-operative research

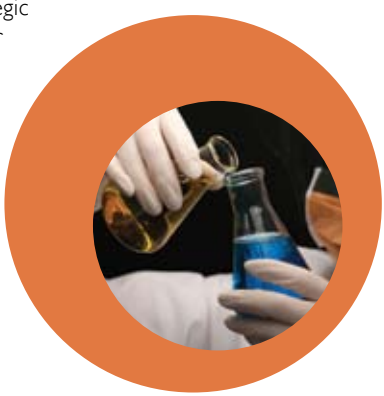
Co-operative Research allows a number of SMEs from different countries to come together around an idea, and assign a significant part of the scientific and technological research behind that idea to RTD-Performers. The SME participants retain the Intellectual Property Rights, whereas the RTD-Performers are fully remunerated for the research activity undertaken. It is a bottom-up scheme and hence covers any scientific topic proposed by the SMEs involved. The scheme facilitates transnational R&D cooperation between SMEs and Europe's research community.

Collective Research

In a Collective Research project, RTD-Performers undertake scientific and technological research activities on behalf of an Industrial Association or Grouping (IAG) in order to expand the knowledge base of larger communities of SMEs. As such, the competitiveness for a given sector is improved, and the benefit to individual SMEs more widespread. In all cases, the IAG retains the ownership of the results. Such projects investigate pre-normative research issues, technological problems related to legislation, and even an entire industrial sector that could not possibly be addressed by Co-operative Research projects.

Economic and Technological Intelligence support actions

The primary goal of Economic and Technological Intelligence support actions (ETIs) was developed to provide strategic research support to European SMEs by improving their access to scientific and technological information. Later, under FP6, this initiative developed into a mechanism focused on helping SMEs in specific sectors to partake in mainstream research projects, and to improve their competitiveness. However, in this scenario the actions are not undertaken by the SMEs, but rather by intermediaries with access to dissemination channels, such as SME National Contact Points, industrial federations, chambers of commerce, and so on.



*For further information on EU funding schemes, and how to participate, please visit the SME ***TechWeb*** at sme.cordis.europa.eu

Main findings

The principle findings of the impact assessment are as follows:

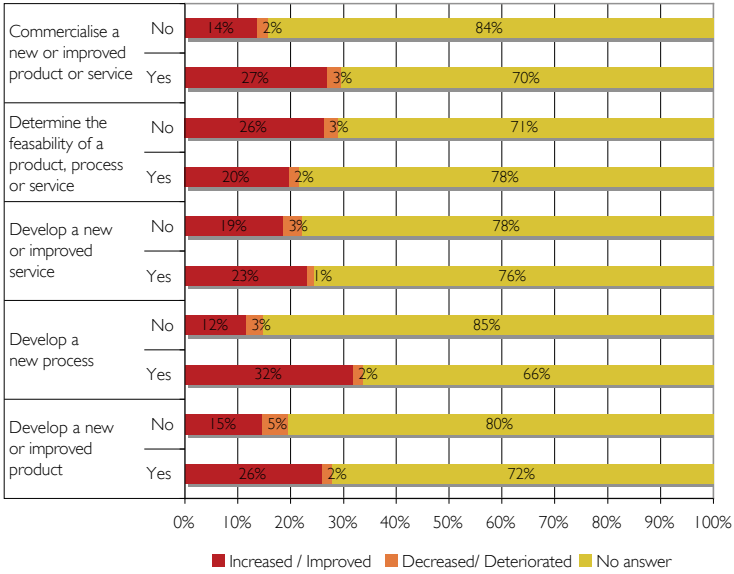
- All schemes have a high net-value effect
- Within Co-operative Research, a high number of "technologically competent" SMEs participate
- The important role of RTD-Performers in the initial stages of project selection and submission was identified
- The high net effect of the Collective Research scheme, which fills an important gap in the EU-RTD support landscape, was noted
- ETIs have a strong structuring effect, and few alternatives are available
- Further effort with regard to business intelligence is needed in order to increase socio-economic impact

The impact assessment shows that the Commission funding schemes have accurately identified a need in the European funding landscape and successfully addressed that need. Each scheme has a high net effect for all of those involved. A majority of participants state that their project would not have been carried out were it not for EU funding, and that they topped off the cost of the project with their own money. The fact that private firms contribute increasing amounts of their own funds to research, is an important element of the Lisbon Agenda. Increased R&D funding from the private sector is considered essential for the success of the European knowledge-based economy. There is clear evidence that these schemes fill a gap in the public support architecture that is not filled elsewhere. The vast majority of national funding initiatives do not allow for international cooperation — *a requirement* of EU schemes — helping likeminded companies throughout Europe to reach their technological goals.

The Co-operative Research scheme is geared towards technically savvy SMEs that are capable of identifying opportunities in the market, yet lack the resources to bring their idea to life. These schemes indeed place effective tools at the disposal of innovative SMEs to help them overcome financial hurdles. Though SMEs with 'minimum capability' for technological innovation are eligible to participate, the SMEs most likely to obtain funding are more likely to be 'technologically competent'. They tend to be firms incorporating several engineers,

with budgetary discretion and a propensity for networking. This fact can be interpreted as a real added value of the European SME-specific schemes, i.e. those SMEs wishing to evolve and develop technologically, turn to the EU to do just that.

SCIENTIFIC AND TECHNICAL IMPACTS AND COMPANIES' TURNOVERS



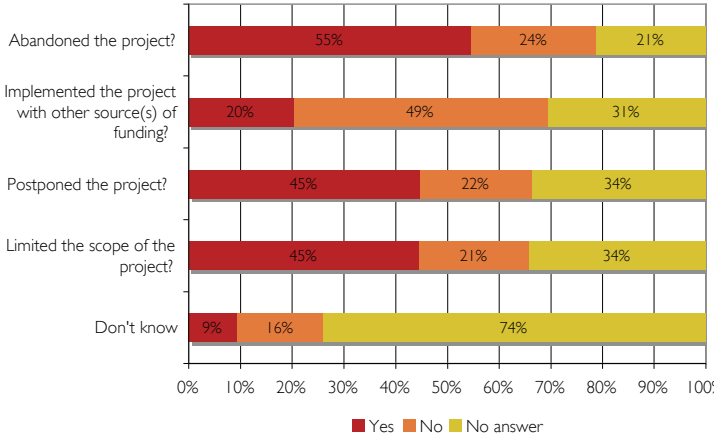
NB : Several answers were possible. The high proportion of "no answer" is a distractor and only differences among actual answers for each type of impact are meant to be indicated. The method of calculation resulting in the percentage shown, is based upon a comparison between the number of responses for the specific item concerned, and the overall pool of respondents questioned.

The assessment also suggests that research institutions play a vital role in helping projects get off the ground. Though the idea for a project usually comes from an SME, particularly in Co-operative Research, RTD-Performers are involved in the early stages of the proposal, building the consortium and submitting the application. This scenario indicates that projects initiated by RTD-Performers tend to have a higher socio-economic impact than SME-initiated projects.

There are several reasons for this, including the following:

- They are better at anticipating emerging technologies and markets
- They have a more comprehensive understanding of what is important
- They are better suited to embracing longer-term perspectives
- Their organisational structure is better suited to preparing and managing large European projects

WITHOUT THE CONTRIBUTION OF THE EUROPEAN COMMISSION, WOULD ORGANISATIONS HAVE…, (By type of reaction; aggregated responses)



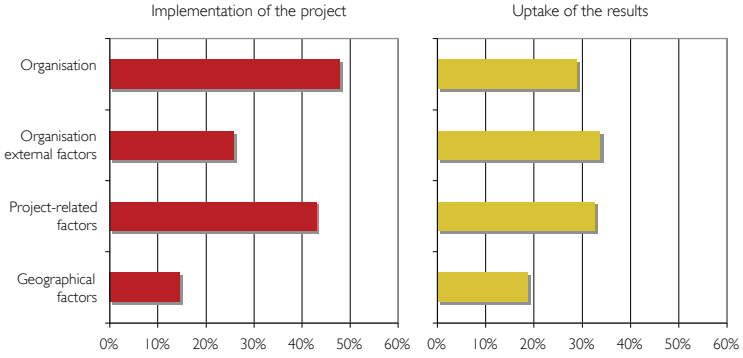
There is evidence to support the belief that Co-operative Research is more effective (in terms of market share, profit and turnover), when such projects focus more on **process innovation rather than product innovation.** Learned processes can create lasting organisational changes that enhance an SME's ability to gain market share and increase turnover.

The study highlights an interesting insight, particularly for Co-operative projects, i.e. that the failure to detect changes in the market negatively impacted the socio-economic performance of the project. In many cases the project achieved (or exceeded) its *technical* objectives, only to come up short with regard to the *economic* expectations. Often competing technologies or market shifts were not anticipated by project consortia, and consequently the partners missed out on important opportunities that could have been generated by the project. Also, several projects

led to great innovation, only to discover that there was no market for the technology post-project completion. In some cases **regulatory changes** may be required, to foster a new market for the products or processes developed. Market anticipation and competing technologies or services may be areas needing more attention, in evaluating future project proposals. Furthermore, this finding may also point to a **lack of business intelligence skills** within companies, which might be better addressed through additional measures at national level.

Collective Research, like Co-operative, has achieved, and often exceeded, its stated objectives. As with Co-operative Research, the Collective scheme fills a gap in the funding landscape not addressed elsewhere. Collective projects **rely heavily on RTD-Performers** for their initiation and implementation, despite the fact that the ideas tend to come from Industrial Associations or Groupings (IAGs). These associations are extremely competent at identifying the needs of an entire industrial sector, and RTD-Performers build on that knowledge to devise a corresponding solution.

MOST IMPORTANT SUCCESS FACTORS FOR THE REALISATION OF THE PROJECT, AND THE UPTAKE OF THE RESULTS AFTER THE PROJECT
(By type of factor; aggregated responses)

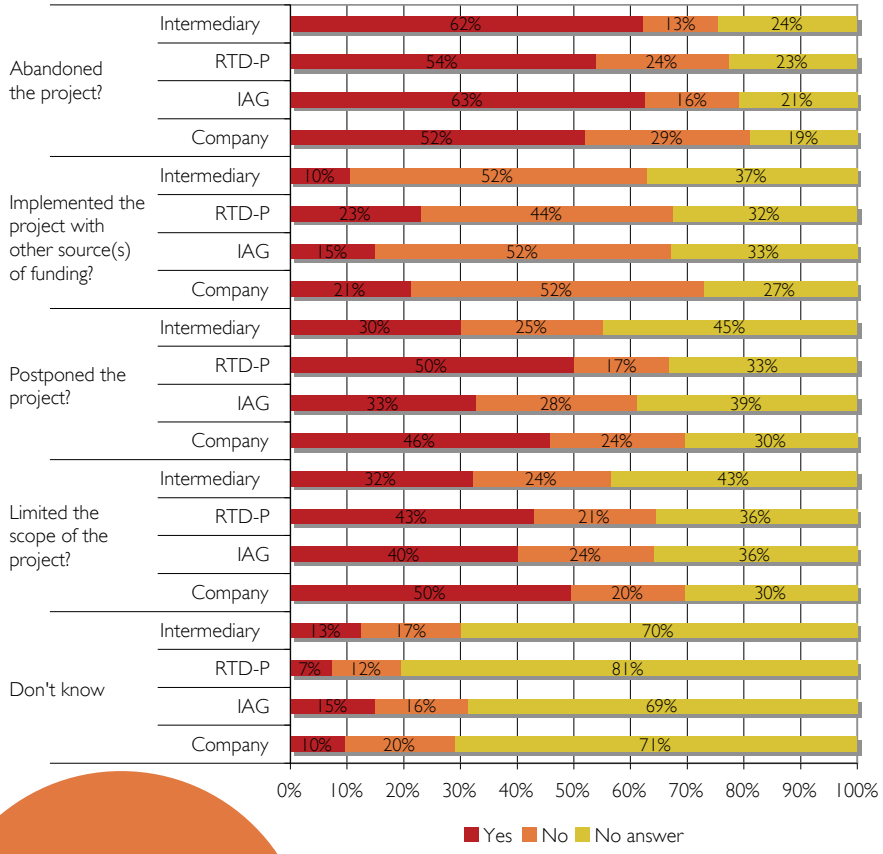


Total number of respondents: 1169

The impact assessment shows that the Collective scheme has a higher net effect than Co-operative projects. Participants in the former state that the research conducted in the Collective project is closely connected to their core business. This can be interpreted as the 'core group' SMEs being carefully selected to participate.

An important impact of the scheme lies in the **increase of cross-border cooperation** between the parties involved. Again, few national initiatives have such a stated objective (though this could be changing).

WITHOUT THE CONTRIBUTION OF THE EUROPEAN COMMISSION, WOULD ORGANISATIONS HAVE…
(By type of reaction and by type of actor)



Total number of respondents: Company 543; IAG 67; RTD-P 416; Intermediary 143

The net effect of Economical and Technological Intelligence (ETI) schemes is considerable. They're quite **successful at helping companies and organisations participate in funding schemes**. They also serve as a vehicle linking SMEs with foreign partners and research organisations. The SMEs contacted for the survey noted that there is an ongoing need for high quality and relevant information on EU funding and cross-border cooperation opportunities, and ETIs are well placed to do just that.

Case studies

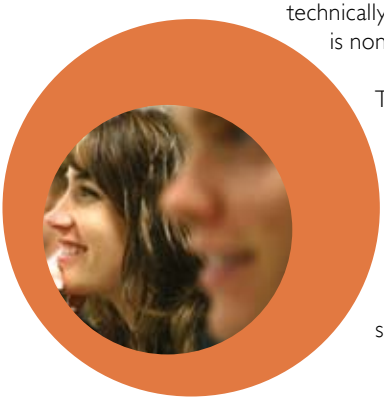
Case studies are useful when an in-depth examination of a specific scenario is required that involves answering those 'how' and 'why' questions, or when it is important to take contextual factors into account. Here we consider a selection of cases to get an idea of the on-the-ground impact the different EU SME funding schemes had upon participants.

Through the in-depth analysis of certain projects, the main findings of the impact assessment emerge. For example, in CRAFT/Co-operative projects, the idea usually comes from an SME. For Collective projects, the idea often comes from the IAG, and in ETIs they appear to come from the associations.

It is important to note that even if the idea comes from the SME, there are many examples to demonstrate that the SME has often established a prior relationship with an RTD-Performer. It might be more accurate to say that 'initiator-SMEs' tend to be 'R&D-inspired'.

A second important observation would be the relevance and uniqueness of the schemes. **Without exception**, the cases show that there are no comparative national schemes, when one considers the international dimension. However, it is worth noting that partners often admit to the fact that they would have undertaken the project without EU funding, given the importance of the issues at stake.

All projects generally achieve their technical objectives, and at times more than exceed expectations (see the Europabio case study). This indicates that project goals seem to be well defined and reasonable. Again, this is less so for the economic impacts. In some cases, once a technically successful project is completed, it transpires that the market is nonexistent (see the DELFIN case study).

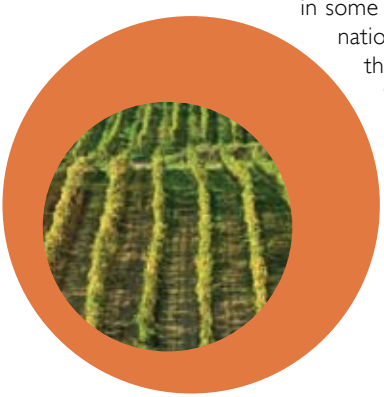


The CRAFT/Co-operative case studies show a high structuring effect, especially on low-innovative SMEs as they gained experience and knowledge on how to better operate in the market. Also, CRAFT/Co-operative consortia tend to be integrated companies occupying different positions on the value chain or having complementary assets. Inversely, this is less so in Collective and ETI projects, as large groups of SMEs are concerned with identifying common solutions for specific problems.

The DELFIN project is an example of a project that had very good technical results but was confronted with unexpected economic challenges once the project was completed. DELFIN was a CRAFT project that ran from January 1997 to December 1998, and was funded under FP4. The goal was to find and develop ways to prevent the cork used in wine bottles from contaminating the bottles' precious cargo. The project partners noted that, €500 million worth of wine is ruined due to chemical or microbial contamination from corks, every year.

The DELFIN case is rather interesting for a number of reasons. Firstly, it is a typical example of a consortium of low-to-medium tech SMEs with little capacity for R&D, coming together and outsourcing the research to an RTD-Performer. This had important implications for the SMEs in terms of an increased level of quality for their product, as well as the realisation that R&D can indeed have a serious impact on their business model. Secondly, this case is a good example that demonstrates where increased business intelligence might have helped them — they could have anticipated the market changes that occurred during the project, which later tempered the benefits derived from the research portion of the project. They were successful in meeting their goals, and indeed exceeded their original expectations. However, during the course of the project, the cork market was flooded by imported plastic corks that did not run the same risk of contaminating the wine.

The idea behind DELFIN came from the German cork producers Rudolf Ohlinger, who understood that they needed to develop new ways of purifying the cork used in their products. Once Ohlinger had identified a need, they turned to the industrial suppliers they had worked with for years, Juvenal and Oller, for assistance. So in a sense, Ohlinger became the driving force behind the project. Perhaps unsurprisingly, Ohlinger had already been involved in some R&D activities prior to DELFIN. They had participated in a nationally funded project that focused on wine research. During that project, they had worked with the research institution Staatliche Lehr- und Forschungsanstalt fur Landswirtschaft, Gartenbau und Weinbau Fachbereich Phytomedizin (today known as DLR). So when Ohlinger decided to participate in a CRAFT initiative, DLR seemed like the natural choice for a partner.



The relationship between the partners was that of producer and supplier. Oller produces sparkling wine corks, Juvenal produces still wine corks and Ohlinger purchases corks from both of them, refines them and sells them on to wineries. This was the first research project for both Juvenal and Oller. Cork companies in general are technology followers and undertake little in-house R&D. For its part, Ohlinger had always been technologically inclined. They first patented a cork in the 1960s and continued in this vein, even after DELFIN proceeded to investigate cork contamination with other partner RTD institutes.

As for the administrative aspects of the project, all partners reported a generally positive experience. Having never participated in such a project, they were a bit surprised at the amount of work such European funded projects entail. The financial aspects proved to be no real issue. The only problem they encountered was due to the fact that the RTD-Performer needed to purchase some expensive equipment early in the project, that ate into the initial budget more than had been originally planned. The partners found that the whole process of dealing with the Commission, went very smoothly. This could be attributed to their particular scientific officer; however all other contact with the Commission was reported to be positive as well. In this particular case, partners received little support from the IRC and had no substantive contact with the NCP.

The main thrust of the project involved processing cork to remove contaminants that later run the risk of contaminating the wine. A traditional method involves boiling the cork, though this has its limitations. Cork is an excellent heat insulator, meaning that the inner portions of the cork fail to reach temperatures sufficiently high to eliminate all contaminants. Early on in the project, the RTD-Performer started to explore new ways of removing contaminants and quickly focused on using microwave technology, which led to the principle discovery of the DELFIN project.

The DELFIN consortium was able to patent a microwave process for treating cork. In addition to this material asset developed through the project, an unexpected output of the project was the altered perception on the part of the SMEs, concerning the necessity of R&D in their business model. Juvenal, the still wine cork producer, went so far as to start a company-based development programme that built upon the DELFIN microwave process, something almost unheard of for a relatively low-tech cork-producing SME.

IMPACTS

The technological results far exceeded what was expected at the outset. Consortium members hadn't realised exactly how the worh of a product could be improved through the added value of R&D. As a result, the companies suspected their innovation had the potential of creating over 100 new jobs and of saving millions of euro each year by reducing spoilage.

However, despite the initial excitement, the partners soon found themselves in an unanticipated situation. The 'closure' market in general had seen some recent innovations of its own. Screw tops and synthetic corks had become more widely accepted by consumers and producers, meaning wood corks had less of a market available to them, reducing the return of the partners' investment in the project. The market had undergone a certain shift not foreseen by the DELFIN consortium.

Overall, this particular project has had little net impact on the SMEs and the cork industry as a whole. All partners had the benefit of having participated in research; however, sustained R&D activities are needed, to be able to stay flexible and adapt to changes in the market. One single research project can't be expected to suffice for the life of a company, and the cork industry has a reputation of being a low-tech industry and relatively resistant to change.

CONCLUSIONS

Although the project itself can be seen as quite successful, this example illustrates how potential impacts of a project can be affected not only by the market, but also by an SME's lack of impetus to change, despite evidence of what can be achieved through long term investment in R&D.

This does not necessarily mean that the approach of the programme is incorrect. In fact, the participants claim that taking part in CRAFT has indeed been beneficial, and that if they were to undertake R&D again in the future, they would certainly consider this mechanism. Having a mechanism available to them that fitted their exact needs was a key incentive that encouraged the SMEs to get involved in European funding. The consortium stated that they were not guided toward CRAFT by an NCP or IRC, but that they had found it themselves.

Project title
Development of an innovative technique for the production of microbial and chemical inactive wine and champagne cork stoppers

Funding scheme – Framework Programme
CRAFT – FP4

Duration
January 1997 – December 1998

Total cost, EC contribution
€998 000, €499 000

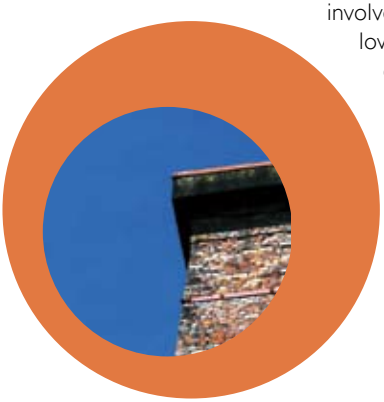
Project Coordinator
Rudolf Ohlinger GmbH, Germany
Jens Jäger
j.jaeger@ohlinger.de
http://delfin-corks.com/

CLEANAIR is an FP5 Co-operative Research project which sought to develop a compact device to remove particulate matter from domestic chimney emissions. The project originated from a single high-tech SME, Applied Plasma Physics (APP), who already had experience working with the main RTD-Performer of the project, the National Institute of Technology of Norway. When the SME came to the RTD-Performer with the idea, it was the RTD-Performer who suggested applying for EU funding. At the time, the National Institute of Technology was already involved in several other such projects. Not only that, but its main business was focused more towards the SME research arena than other Norwegian institutions, which focus on more mainstream research. Pera, the secondary research performer, also had extensive experience working with EU projects and had an established relationship with the TI.

Once APP and the National Institute of Technology (NIT), agreed to go ahead with the project, it was up to APP to seek out the other business partners on its own. Here APP was aided to a degree by the TI and their existing network, but had no contact with the NCP.

As can be seen in many of the cases, the RTD-Performer took the lead in handling the administration of the project. This occurred for a couple of reasons. Firstly, as mentioned above, NIT had previous experience handling the processes associated with undertaking an EU-funded project, and also had greater resources with which to do so. For APP this would have represented a rather weighty upfront investment in terms of time and energy.

Though the relationship overall between the SMEs was good, it was noted that at the beginning there was a certain level of naivety on all sides, as to what the project would bring in terms of results, and what they would be expected to contribute. The involvement of the other SME partners was indicated as being lower than what was originally hoped for. To some extent this corresponded to the selection of the partners – in a future project, the coordinators felt they would be more involved in the selection process, being more aware now of the implications. The coordinators of CLEANAIR felt that they ended up doing a great deal more work than initially expected, to keep the project and its administration on track.



Concerning contact with the Commission, the experience was described as being positive. The partners received solid support from the project officers. There was a change of officers during the course of the project, though this did not create any added difficulties. There was the general feeling, however, that the Commission's priorities were too detail-oriented, rather than having an eye on the 'big picture'. An example given by the partners was the fact that they were required to redraft the Technology Implementation Plan into a new format, even after the original had been completed. On the other hand, the consortium does stress that the Commission was, and continues to be, particularly supportive in the promotion of the project and its outputs.

IMPACTS

Technically speaking, the project was a success. The project required innovation in two areas — a dust removal system with a specified efficiency of over 90%, and a miniaturised high-voltage supply within the unit — this latter being the bigger challenge. A prototype was developed within the context of the project, though the core technology is not patentable. The product requires further work to make it market-ready.

Market take-up of the technology was less enthusiastic than originally expected. This is another instance of the project meeting all of its set goals, yet once the project was completed finding that, there wasn't much of a market for the product. The project has a very strong potential societal impact since it ventures to significantly improve air quality in urban areas. However, there are currently no regulations making such technology absolutely necessary. There is currently no political atmosphere, at European level, to back such emission reducing technology. Work is continuing on the product, as it is expected that the right environment, making the technology profitable, will eventually come about.

Due to the aforementioned air-quality improving properties, the technology can also be used to make wood and other bio fuels more sustainable and attractive as alternative energy sources. Again, whether or not this develops into a real opportunity for the SMEs to capitalise on depends on a shift in the prevailing regulatory regime. In this regard, the product is considered to be slightly ahead of its time.

The SMEs participating in CLEANAIR clearly benefited from the experience of working together under the auspices of an EU-funded project. They can use this experience to develop further networks in the future. The project coordinator and research performer continue to be in contact with one another; however, they had a well-established relationship before the project began. Though lasting bonds failed to develop among the SME partners, primarily due to reluctance to invest further in the product, partners are working independently with the technology, and looking for new business partners.

CONCLUSIONS

The project was considered a success, though the technology may be too early to market to have a real commercial impact. The project benefited greatly from the support of the research performer due to the fact that it had participated in other projects. The funding scheme filled a gap in the landscape for the SMEs, as no national program exists that would have made this project possible. No lasting relationships developed among the partners that hadn't already existed at the outset of the project.

Project title
Enhanced quality of life for 76 million EU citizens by enhancing air quality in urban areas through development of a residual cleaning technology for burning solid fuel for domestic use

Funding scheme – Framework Programme
Co-operative Research – FP5

Duration
May 2002 – April 2004

Total cost, EC contribution
€1 250 810, €625 403

Project Coordinator
Applied Plasma Physics AS, Norway
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www.app.no

Hail, frost, insects and other natural hazards present a real threat to a farmer's productivity. Certain solutions exist to help farmers protect their crops to ensure that they have a profitable harvest each year, one being the frequently discredited use of pesticides and other chemical treatments. Farmers and environmentalists alike have long been interested in employing alternative solutions for protecting their livelihood, and AGRONETS developed from this need.

AGRONETS is a Co-operative Research project funded under FP6 that ran from September 2004 to September 2006. The main thrust of the project was to develop a standard practice of sorts, for using horticulture nets to protect crops from natural hazards in general and insect infestation in particular. When the project got under way, the horticulture net market consisted of a patchwork of solutions, using a range of substances and exhibiting a variety of physical characteristics. Due to the fact that there was no established best practice at the time, farmers were left to their own devices to evaluate the performance of such nets, through the process (at times frustrating, always inefficient) of trial and error. The basic idea for developing a systematic design methodology for designing agricultural net supporting structural systems and for standardising the measurement of the agricultural net characteristics, was developed by the Natural Resources Management and Agricultural Engineering department of the Agriculture University of Athens in cooperation with RTD Agrotechnology and Food Innovations institute in Wageningen. The two research groups had already established a good working relationship through their participation in other European research projects on various topics in the area of materials and farm structures for protected cultivation. The Dutch SME Howitec and RTD Agrotechnology and Food Innovations, also having a history of collaboration, were well aware of the problem and asked themselves if there wasn't a better way for farmers to be sure they weren't wasting their time and energy in erecting nets that weren't necessarily best suited for their purposes, or that were being used incorrectly and inefficiently. They decided to develop a research project to produce integrated permeable protecting structures (PPS) that would guarantee maximum stability and predictable performance under the myriad of climatic conditions farmers face, across the continent and beyond.

In AGRONETS' case, the consortium developed more organically than it did for other projects (such as CLEANAIR for example). In addition to having worked together in the past, Howitec and the Agrotechnology and Food Innovations institute had had contact with the Dutch NCP two years earlier to discuss the possibility of mounting a project together. Howitec had a well-established producer/vendor relationship with the SME Arrigoni SPA of Italy, so naturally extended them an invitation to enter the consortium. Arrigoni's main business is producing nets, so their motivation for participating was evident. In terms of research, both the Natural Resources Management and Agricultural Engineering department of the Agriculture University of Athens and the Agrotechnology institute had participated in other research projects with the National Resources Management and Agriculture Engineering

department of the Agriculture University of Athens, as well as the University of Bari in Italy; therefore, once they were contacted, the research performer aspect of the project was complete. The final member of the consortium was Agrek, a construction company with interests and activities in the rural and civil building sector who had had some co-operation with the Agricultural University of Athens within the context of a previous research project.

With the addition of Agrek, the entire commercial chain of the net market was represented, which makes AGRONETS an exemplary case for the impact assessment. Arrigoni is the producer, Howitec the retailer and Agrek the end user of the nets as well as the constructor of the structural systems supporting the nets. As is often found to be the case in Co-operative projects, the SMEs state that this scheme was their only opportunity to conduct research as they don't have the capacity to do so independently. The RTD-Performers maintain that the research reinforced their innovative capacity and helped them to shore up their networking capability.

The project followed a natural progression with the first phase, which was primarily experimental, being carried out mainly by the RTD-Performers. The SMEs had an advisory role at this stage, conducting market research and investigating technical issues associated with horticultural nets. The SMEs saw greater involvement in the second phase of the project, where they would integrate the research into the design of the integrated system of permeable protecting structures.

IMPACTS

The research performers in this case worked together in perfect synergy. They planned to publish their results in several journals and seek funding to continue their research once the project was completed, as well as participate in prestigious industry conferences in the field of agriculture engineering. Nevertheless, there proved to be some friction between the SMEs and the research performers initially, due to the fact that they had conflicting priorities. The SMEs were anxious to move past the research phase and closer to development and implementation. The consortium was sufficiently confident in their cooperation and mutual investment to establish contacts with the European Committee of Standardisation, so as to discuss the added value potential of their finished product.

Another important impact of the project was the fact that the participants realised the important role R&D can play in their company (also evident in the DELFIN case study). Howitec now argues that R&D is 'essential' for them to stay competitive in the nets market; what's more, knowing that it can't do the research alone, it plans to reinforce its contact with universities. The research performers claim that they are now better at understanding the needs of SMEs, a result that helps to create an environment that is conducive for further research. In addition, they were excited about the idea of focusing university attention on 'real' problems,

something that is also expected to foster further research. The project also planned on establishing a common test method for nets that will be used in further research by them and (ideally) throughout the whole nets market.

Not only did participation in the project increase the knowledge-absorption capacity of the SMEs, it has made them more adept at identifying technological gaps in the market, allowing them to search for new innovation opportunities. As a consequence of this project, each of the SMEs has mentioned a desire to branch out into other markets, expanding their business in ways they might not have considered possible before the project started. In addition to these very concrete benefits, they mentioned that they have accrued a certain level of prestige within the industry through their association with an EU-funded initiative. Their connection to the EU seems to confirm their place in the industry as companies whose products are of high enough quality to merit attention from the Commission. This is also true for the research performers.

Finally, AGRONETS has a strong societal impact, particularly regarding food safety and sustainable development. Again, thanks to the success of the project, growers can move away from chemically intensive treatments of their products, while still ensuring a bountiful harvest. Also, the RTD-Performers have been able to take on extra staff, particularly the temporary employment of young researchers. The young researchers gain valuable experience that in turn makes them more attractive to future employers.

CONCLUSIONS

Despite such success, in this example, we can again find ways in which the overall success of the project, though technically successful, is threatened due to lack of business intelligence. Here the SMEs do not have a clear idea of how they will manage the new products once they are ready to bring them to market. They have an obvious lack of experience in managing property rights, which leaves the future of their joint product less than secure. The report notes that the Framework Programme might benefit from having increased attention paid to innovation management within SMEs.

Project title

Development of protective structures covered with permeable materials for agriculture use

Funding scheme – Framework Programme
Co-operative Research – FP6

Duration
September 2004 – September 2006

Total cost, EC contribution
€1 247 336, €824 710

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This case is one of the two Collective Research projects included in the impact assessment. It involves players in the textile industry interested in improving the environmental impact of textile finishing, on our water supply. Specifically, the objective of this project was to develop a novel concept for a compact, high efficiency and cost-effective treatment plant for wastewater recycling. The technical objective of Space2Tex was to apply the technology of membrane bio-reactors to the biodegradation of textile dyeing and finishing pollutants, thereby reaching levels of water cleanliness otherwise achievable only through multiple treatment processes and complex costly systems, which are usually out of reach for the average textile SME.

SPACE2TEX was initiated and coordinated by the European Apparel and Textile Organisation (Euratex). It was a three-year-long project funded under FP5. This project is unusual in that it was originally conceived within the framework of the European Space Agency's Technology Transfer programme, designed to apply space technology to new markets. The technical aspects of the project were coordinated by the Italian engineering company D'Appolonia in connection with the 26 Core Group SMEs.

IMPACTS

The reported impact of Space2Tex proved to be mostly of a material nature, as opposed to a process-oriented or structural one. First, the project produced a lab-scale process and prototype, developed by Belgian project partner VITO that allowed for the identification of the membrane bio-reactor's performance with respect to biodegradation efficiency. From VITO's lab-scale model, a container-based pilot scale plant was also prototyped, constructed and tested under real industrial conditions. A first six-month trial installation ran at one of the Core Group SMEs in Italy, under the responsibility of D'Appolonia, and a second industry installation took place in the Czech Republic, coordinated by Inotex, both with continuous remote follow-up by VITO.

Other significant outputs of the project were the Space2Tex Database and the Chemicals Database, developed by the French Textile and Apparel Institute (IFTH) to rationalise information collected directly from SMEs. The Space2Tex Database contains detailed sets of relevant technical data for the design and engineering of waste water treatment systems for typical textile dyeing, printing and finishing processes existing today in SMEs across Europe, while the Chemical Database constitutes a reference knowledge base on dyes, chemicals and auxiliaries typically used by the industry.

Finally, the SPACE2TEX Design & Training Tool, was developed by D'Appolonia to provide potential industrial users of the Space2Tex system with a means to self-evaluate the suitability of the Space2Tex system to their specific requirements. The training tool aids SMEs across the European textile sector (and beyond) in estimating dimensioning of the Space2Tex system and required/recommended optional components or sub-units given specific wastewater conditions; the tool also aids them in estimating costs associated with the installation and operation of the Space2Tex system within a specific industrial scenario.

SPACE2TEX is a fine example of how a Collective Research project can successfully bring together a European IAG and European RTD-Performers in a traditional (non-high-tech) sector around a technology-intensive project. The high number of Core Group SMEs demonstrate not only their interest in this green technology, but the need for public funds from European level, to help bridge the funding gap faced by SMEs when conducting eco-friendly research. At the time of the impact assessment, many of the consortium's objectives had been met, i.e. the membrane technology had been developed according to plan, databases and software had been developed and operated efficiently, and the pilot plant was functioning as expected.

CONCLUSIONS

Despite the extremely promising technical results — as compared with the extremely innovative dimension of the project (dual technology) — there was some doubt on the part of the stakeholders as to whether the technology would actually be taken up on a large scale. More specifically, the levels of development and the financial robustness of the companies differ considerably according to the European countries where the SMEs are located, and therefore compliance with environmental regulation is prioritised in different ways. International competitive pressure was so heavy at the time, that even some of the Core-Group SMEs went out of business before the project was completed. As environmental regulation can vary between Member States, this project also served to improve concrete European integration, where cooperation leads to the development of technology that is above and beyond what an individual SME might envision or implement on its own.

Project title
SPACE2TEX

Funding scheme – Framework Programme
Collective Research – FP5

Duration
January 2001 – December 2003

Total cost, EC contribution
€2 132 732, €1 066 132

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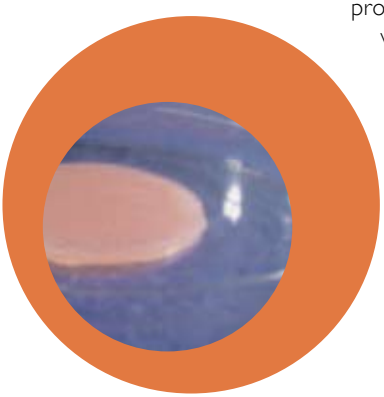
DERMAGENESIS

Collective Research - FP6

DERMAGENESIS is a Collective Research project, with the tanning industry as the primary beneficiary. Due to recent flux in the leather market, both social and economic, the Italian IAG UNIC (l'Unione Nazionale Industria Conciaria) identified a need for R&D in the tanning industry, and saw an EU-funded project as the only vehicle to address that need. UNIC felt that not enough research was being conducted on a regular basis by an industry dominated by small companies, in terms of examining new ways of producing leather. Innovation within the tanning industry is a more acute problem now than ever before in the face of rising competition from emerging economies, particularly from those in the Far East. The DERMAGENESIS project's stated objectives included a study of the availability, quality and raw material yield within the tanning industry, as well as pollution prevention and control. It is a 48-month FP6 project that began in January 2004. The project had not been completed at the time of the impact assessment, though it merits inclusion as a case study due to the manner in which it demonstrates the added value of Collective Research projects. The complexity and strategic importance of the problem was a challenge that couldn't be addressed by a single SME; consequently, the project complied with the research objectives and scope of the Collective scheme.

The originator of the project, UNIC, developed the idea and approached the research institute Conciaricerca, with whom it already had established ties. Together they analysed the proposal and decided that it was indeed worth investigating further for several reasons. They determined that the tanning industry stood to benefit from the diversification of raw materials, particularly ones not derived from animals. Such a move could be seen as a progressive marketing strategy and one that would set new quality standards, as quality tends to be extremely variable in leather. If they were successful in producing an alternative source for their business activities, it would provide them with added negotiation leverage within the leather market. Leather supply is completely regulated by the meat market, placing the tanning industry at a disadvantage when dealing with suppliers. So if they were to develop a synthetic material, they would be in a better position to negotiate with suppliers, and that could ultimately save them substantial sums of money. An alternative product to leather would also help stakeholders enter new emerging markets, such as the vegetarian market, a tough one to crack for leather retailers.



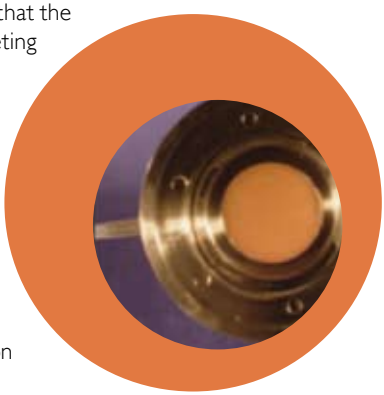
The DERMAGENESIS project is another example where the consortium developed from an established network of partners. Just as UNIC had worked with Conciaricerca, Conciaricerca had experience working with numerous universities and other RTD-Performers, such as the University College Northampton, (which eventually joined the consortium), and UNIC contacted other IAGs from Italy, Spain, the UK and Hungary. All told, these IAGS directly represent over 790 companies at national and international level, most of which are SMEs. To help boost DERMAGENESIS' technological profile, the consortium sought out the assistance of a specialist Biotech research institute of University of Naples "Federico II", as the ideas behind the project were relatively novel for the tanning industry. Moreover, Biofin, a biotech industrial company, was selected to support the industrial production of novel leather.

The partners estimate that proposal submission and negotiation required more than seven man-months of work. Considering the relatively low success rates in securing funding from such schemes, this represented a high-risk investment for those involved. However, even though they understood that they were undertaking very high-risk research that was genuinely innovative, they were confident that they were entering into a project that involved stimulating knowledge-generation, and trusted that they would realise a healthy return on their investment.

From an administrative perspective, the partners reported few problems in their dealings with the Commission. Their financial officer changed twice over the course of the project which led to a slight disruption of the work-flow, though this represented no real problems. They established a website to upload the results of the various stages of the project. None of the partners benefited from any other form of financial support for the project. Any funding short falls were covered out-of-pocket.

IMPACTS

The project created a demonstrator of biotech leather which is considered a major achievement, and the partners are preparing the application for a European patent. The partners are planning to establish a spin-off company that will produce and commercialise biotech leather and the machinery required to make it. They expect that the market for such products depends on their success in marketing it, so naturally the motivation for doing so remains high.



The project was ongoing at the time of the impact assessment, so it was still too early to predict exactly what the total impact might be; however, several positive signs had already emerged midway through the project. Aside from the durable contact established between the research performers and the SMEs, the RTD-Performers planned an extensive transfer of knowledge and capabilities through ongoing training of skilled personnel, as well as defining and exploration of exploitation pathways between the SMEs and RTD-Performers.

The high-tech SME Biofin stood to gain substantially from the success of the project, as they will be the sole producers of the machinery for processing the final product. They had already taken on one external consultant and one researcher to work on DERMAGENESIS, and were hoping to recruit additional staff. The recruitment had had a positive impact on the internal know-how of the company, through the creation of a completely new production line.

According to the partners' calculations, companies using biotech leather stand to save 30% on labour costs, a not-so-negligible statistic in a labour intensive industry such as the tanning industry. They estimated total savings to be 8% on the overall production process. All this was in addition to the money the industry expected to save through added leverage gained in the market when negotiating raw materials with meat producers. The bottom line aside, the project partners predict a positive impact on the environment, as water consumption and the use of chemical products would be drastically reduced.

CONCLUSIONS

The tanning industry has a relatively long history of participating in the Framework Programmes and SME specific measures. There are around 3 000 tanneries in Europe, most of which are SMEs with less than 20 employees. In general, they have undertaken little R&D on their own, relying instead on Research institutes to conduct the research on their behalf. In this respect, the Collective Research scheme was perfect for such a project, as the aim is not to get the SMEs to do their own research, but improve their organisational knowledge and learning, to help them identify technological needs in the market. The multimodal approach of DERMAGENESIS, i.e. changes in raw materials, production and the market at large, are particularly poignant in light of the growing threat from the Far East. This project has demonstrated that Collective Research can have a greater impact on SMEs than a traditional R&D Co-operative project could achieve.

Project title
Bio-engineering of leather: structure design, biosynthesis - Towards zero emission production

Funding scheme – Framework Programme
Collective Research - FP6

Duration
January 2004 – December 2008

Total cost, EC contribution
€4 176 523, €2 088 233

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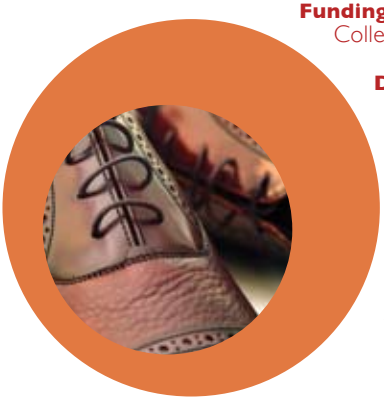


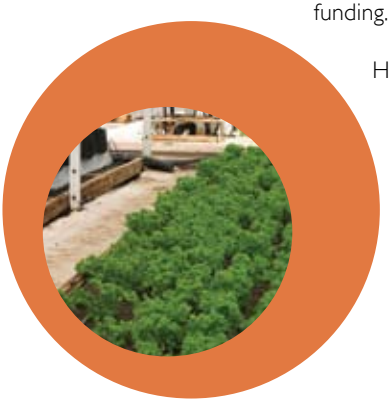
Europabio SME Project

Economic and Technological Intelligence (ETI) – FP5

The European Association for Bio-industries (Europabio) existed prior to the implementation of the Economic, Technological Intelligence Co-ordinated Action 'EUROPABIO SME Project', co-funded by the European Commission under FP5. The project aimed at encouraging European SMEs in life sciences to participate in European FP projects. The initiative was a resounding success.

Eurobabio became interested in participating in an ETI Co-ordinated Action when it realised that there was a noteworthy convergence between Europabio's objectives and that of ETI Actions. Prior to this project, Europabio SMEs had complained that they were unable or unaware of how to access FP projects. They were under the impression that funded projects came mainly from academic organisations. Therefore, at that time, the association was looking for an external financial contribution for actions they had been hoping to initiate anyway. In addition, they felt that having external financial backing and oversight, from the EU no less, would help improve their overall efficiency.

Europabio's national member associations began to establish closer ties with SME National Contact Points, against whom they used to compete. They paired up with the NCPs to implement joint initiatives after it was discovered that they had complementary objectives. For example, they realised that Europabio was especially skilled and experienced in identifying the sector's scientific and technological knowledge base and needs, whereas NCPs were specialised in organising networking events and communicating policy measures. In pooling their resources, the two networks no longer competed for SMEs' attention, (which was unnecessarily counterproductive), thus reducing costs and boosting their impact potential. The project was accepted by the Commission with no outside sources of funding.



However, they did encounter some bumps in the road in terms of administrative hassles, leading to some financial strain for the associations and their members. As the project did not receive outside funding, members were obligated to foot the bill until the EC monies came through, though even such problems were smoothed out in the end.

IMPACTS

The impacts of this particular ETI action were both material and structural. A comprehensive database was developed to include SMEs and research organisations. The database was designed as a resource, allowing members to identify potential partners for future collaboration. The initial target was to have 350 profiles; the final count totalled more than 800. A second output of the project was the strengthening of contacts throughout the network in an attempt to bolster dissemination efforts. The objective was to establish 2 000 contacts, 23 000 were made. One target that was missed represented the hope that 150 SMEs would gain access to Exploratory Awards funding. Only one was successful. This is not surprising however, since the application deadline was missed. A fourth positive output of the project was its success rate in helping SMEs access IPs: 10 were planned, and 97 succeeded. The partners planned 10 training sessions aimed at networking and improving the likelihood that an application for an EU-funded project would be successful. In total, 94 such meetings were held. Two brokerage events were organised, and one of the participants successfully assisted SMEs in proposal writing.

Clearly, Europabio considerably exceeded the goals it set out for itself at the beginning of the project. However, such success proved to be dependant upon the presence, or absence of an existing network prior to the implementation of the ETI. Project results were less impressive in those regions where such relationships were less developed.

As for the principle goal of the project, i.e. getting research projects funded, as a result of Europabio, 97 applications for funding were accepted. The project had hoped for 75. Also, through the profiling system implemented, the partners were able to obtain a detailed cross-section of biotech SMEs operating in the market. Sharing that which makes each company unique was an effective way of raising awareness among SMEs. The ideas and specialisations displayed on the intranet database, gave visibility to all participants, in addition to planting other ideas for further research and cooperation initiatives.

There was another impact of the ETI, in terms of its sustainability. It proved to be such a success that the SMEsGoLifeSciences ETI under FP6 is in effect a spin-off of the Europabio project. The quality control procedures created under Europabio are still in use, and SMEsGoLifeSciences' profiling database weaves together NCP and Europabio SME project databases into a single resource.

CONCLUSIONS

Through its participation in the ETI action, Europabio has become a more efficient interface organisation with an increased ability to negotiate with European regulation authorities and communicate the implications of such regulation to its members. As a result, regulation-related uncertainty diminished within the European biotech SME community. Bio-patents are an example of this. Establishing a common understanding among all those concerned is likely to improve the system's innovativeness and competitiveness.

In addition, Europabio has become adept at defending the interests of biotech start-ups. The sector is extremely dynamic in terms of the creation of new firms, thus creating a need for a specific legal status for companies still in their infancy. A prerequisite for participating in an ETI action dictates that firms must demonstrate a three-year track record, thereby excluding young companies. As a consequence of participating in the project, Europabio realised that start-ups are being left behind, prompting it to start considering special measures for such young firms. It has since lobbied for a specific European start-up act and suggested that the European Central Bank and other financial institutions guarantee loans for start-ups.

Project title
EUROPABIO SME PROJECT

Funding scheme – Framework Programme
Economic and Technological Intelligence (ETI) – FP5

Duration
January 2001 – December 2005

Total cost, EC contribution
€1 797 148, €898 574

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SME definition
A full account of the background to the changes, a comprehensive user guide, and the texts of the Commission recommendation, are available at
http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/index_en.htm

For further information concerning SMEs in Research, please visit
http://sme.cordis.europa.eu/home/

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European Commission

SMEs and Research — An Impact Assessment of R&D Funding Schemes

Luxembourg: Office for Official Publications of the European Communities

2007 – 40pp. – 14,8 x 21 cm

ISBN 92-79-04557-1

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KI-76-06-676-EN-C

The European Commission places great import on the continued success and vitality of SMEs, and as a result it has tailored specific funding schemes to fit their needs. Three such schemes under FP6 are the **CRAFT/Co-operative Research programme, Collective Research programme and Economic and Technological Intelligence (ETI) support actions**. To gain insight into the effects these schemes have upon SMEs and research institutions, DG Research commissioned an impact assessment spanning several Framework Programmes. This is the first time such an appraisal of SME specific schemes has been conducted, giving us the opportunity to examine in detail the benefits SMEs derive from the funding models, as well as those areas requiring improvement, ensuring that SMEs' needs are being duly met at European level.

ISBN 92-79-04557-1

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