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German participation in the Sixth European Framework Programme for Research and Technological Development



RESEARCH

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The most important details in brief

The European Research Area has formed the guideline for European research policy since 2000. This guideline has been steadily developed since 2007 within the framework of the Green Paper¹ on the European Research Area and the Ljubljana Process, which is based on the Green Paper. As an „internal market“ for research, the role of the European Research Area is to establish the preconditions for the mobility of researchers, provide facilities for top-class research and world-class research infrastructures, support the efficient exchange of knowledge and the coordination of European, national and regional research programmes, and encourage strong ties with partners throughout the world. The Research Framework Programmes (FPs), which pool measures to support research and technological development, are the EU's most important instrument for realizing these objectives. FP6 (2002-2006)² with a budget of 16.7 billion euros provided funding for a total of 10,058 projects involving 74,400 partners from EU Member States, associated states and third states.

This study analyses German participation in FP6. It begins by examining the nature and volume of participation by German partners in the projects of FP6 from different angles: compared with other large Member States with high levels of research activity – the United Kingdom (UK), France (FR) and Italy (IT), in the context of all 27 Member States (EU-27) and at German Länder level. It then proceeds to consider the relationship between the results and selected indicators of potential and to discuss this against the background of the different national starting conditions. In addition, interviews and standardized surveys among EU officials and scientists provide an impression of the stakeholders' motives for participation and their assessment thereof. The most important results are:

Participation in absolute terms – Participants, Projects, Coordinators, Topics, Instruments

- **German participants enjoy a strong position in the Sixth Research Framework Programme and receive the most funding with approximately 3 billion euros (UK approx. 2.4 billion, FR approx. 2.2 billion, IT approx. 1.5 billion).**

They account for approximately 18%³ of all the funds granted to participants in the Sixth Research Framework Programme (UK 14%, FR 13%, IT 9%). Germany takes first place with roughly 10,400 participations by institutions (universities, research institutions and companies) and researchers in the projects of FP6 (followed by UK approx. 8,800, FR approx. 7,900, IT approx. 6,600). German partners account for 14% of total participation (UK 12%, FR 11%, IT 9%). They assume the role of team coordinator in roughly a quarter (26%) of the projects involving German participation⁴ (UK 21%, FR 24%, IT 20%).

- **German institutions take third place as host institutions for individual measures in the Marie Curie specific programme (Fellowships) with 9% of participants and 12% of funding (UK: 22% of participants, 27% of funding; FR: 13% of participants, 14% of funding; IT: 6% of participants, 6% of funding). Germany is evidently less attractive as a host country for foreign researchers than the United Kingdom or France. The language barrier inter alia plays a significant role here. The situation regarding institutional Marie Curie measures (Networks) is better: German institutions take second place behind the United Kingdom with 16% of participants and funding (UK: 16% of participants, 21% of funding; FR: 11% of participants, 12% of funding; IT: 7% of participants, 6% of funding).**
- **German partners are active in virtually all of the new instruments of the Sixth Research Framework Programme, the Integrated Projects (IPs) and Networks of Excellence (NOEs), where larger consortia are the rule. They are involved in 169 of the 171 NOEs (99%) and 94% of the IPs (compared with: NOEs – UK 98%, FR 93%, IT 88%; IPs – UK 83%, FR 83%, IT 76%). Germany also leads the field with regard to the smaller research projects, the Specific Targeted Research Projects (STREPs), participating in 70% of the projects (UK 60%, FR 53%, IT 49%) and representing the largest group of participants with 15% (UK 11%, FR 11%, IT 9%).**

¹ COM(2007) 161: Green Paper „The European Research Area: New Perspectives“.

² FP6 was officially announced for the period 2002-2006; project contracts were signed in the period 2003-2007.

³ 20% of return flows to EU Member States.

⁴ As a basic principle, references to coordinators in this study exclude participations in "Human Resources and Mobility" (MarieCurie). The task of "coordinator" in a MarieCurie individual fellowship or institutional network differs substantially from the tasks of a coordinator in a cooperative thematic (research) project and can therefore not be compared.

- Participation by German private industry in the Framework Programme is above average. Approximately a quarter of German participations (26%) involve companies, significantly more than in FP6 as a whole (19%). German universities (31%) as well as non-university research institutions (30%) and companies (26%) are relatively equally represented in the Framework Programme⁵. By comparison, the United Kingdom focuses on universities (universities 55%, non-university research institutions 14%, companies 18%), France on non-university research institutions (non-university research institutions 40%, universities 19%, companies 24%).
- Germany is striving to increase the rate of participation of small and medium-sized enterprises (SMEs) in the Framework Programme. Unfortunately, the FP6 contract database is not consistent with regard to the SME status of participants⁶. A relatively substantial share of information is missing, signalling a systematic underestimation of participation by SMEs. Under this proviso, small and medium-sized enterprises accounted for at least 13% of participants and 9% of funding in FP6. German SMEs accounted for 15% of German participants and 10% of funding (UK 13% of participants and 8% of funding, FR 13% of participants and 9% of funding, IT 16% of participants and 12% of funding).
- Participation by German partners as well as by participants from the United Kingdom, France and Italy has remained at a consistently high level over the period of the Sixth Research Framework Programme. However, the relative shares of participants fell in the course of this period due to EU expansion to include 10 new Member States in 2004 and as a result of increased participation by third states.
- The high level of German participation also means that participation by the individual Länder plays an important role within the

Framework Programme. From the point of view of the level of funding, the three largest Länder – Baden-Württemberg, Bavaria and North Rhine-Westphalia – take 8th to 10th place in the ranking of EU Member States, between Sweden and Austria. These three Länder account for approximately 55% of German participants, coordinators and funding. The results for Berlin are quite surprising: as a City-State, it takes fourth place behind the three large Länder as far as funding is concerned and takes 15th place behind Finland in the EU comparison.

Participation in relative terms– Participation compared with research potential

- The Member States' shares of the EU budget can be compared with the shares of funding they receive from FP6 in a benchmarking exercise. In this comparison, the funding which German partners receive from FP6 corresponds to Germany's share of the budget in 2006. By European comparison, Germany has a more positive balance than France, Italy and Spain and when one deducts the UK rebate from the budget contributions a more positive balance than the United Kingdom.
- In relation to its potential – expressed in terms of the level of public expenditure on Research and Development (R&D) and R&D personnel – Germany's position in the Framework Programme is similar to that of the other large Member States, particularly the United Kingdom and France. The situation is different in comparison with the smaller Member States. Compared with the number of researchers (R&D personnel), the funds which the German partners receive from FP6 are below average against the background of relatively high public R&D expenditure. Smaller countries, among them especially Belgium, the Netherlands, Ireland, Denmark, Sweden and Austria receive significantly more funding per researcher against the background of comparable levels of public

⁵ Institutions such as ministries or territorial authorities, non-commercial organizations and others account for the remaining 13%.

⁶ European Commission: FP6 Final Review, Brussels, June 2008.

R&D expenditure. Possible explanations are different needs or the different significance of the Research Framework Programme according to the respective national starting position:

- Generally speaking, the FP can replace national public R&D expenditure in small and very small states – this would not be possible in large Member States if they wanted to maintain a viable research landscape.
- Smaller Member States with a good research infrastructure have a significantly greater need to cooperate internationally than large Member States where there are already many opportunities for cooperation on a national basis.
- For the large Member States, the FP represents an important instrument to complement national research funding, particularly with regard to the globalization of research. Nevertheless, the incentives for cooperation are greater for participants from smaller Member States.
- Analogously to the findings at Member State level, the estimate of potential at German Länder level indicates a good exploitation rate in the case of small Länder – Saarland, the City States of Bremen, Hamburg and Berlin but also Brandenburg – with active partners and a manageable number of potential stakeholders (in particular universities and non-university research institutions). By comparison, the highly populated Länder of North Rhine-Westphalia, Baden-Württemberg and Bavaria with their large scientific infrastructures do not score so well, despite being the mainspring of German participation in absolute terms. Those active partners who are involved or repeatedly involved in the Framework Programme contrast with a larger number of universities, research institutions and companies which are not

involved at all or only to a small extent. This could be due to the fact that their specialist orientation is not reflected in the Framework Programme, to a lesser need for participation or to the anticipated cost-benefit ratio. Furthermore, national R&D funding measures are an attractive alternative to participating in the Framework Programme since they offer considerably better chances of success in the application procedure, do not require cooperation in an international consortium and involve fewer administrative demands with regard to project management.

Cooperation in the Research Framework Programme

- The Sixth Research Framework Programme is an important instrument for establishing international cooperation projects. In the course of projects under the Sixth Research Framework Programme, German partners cooperated with a total of approximately 45,150 participants from 138 of the 152 nations involved. The most frequent cooperation partners apart from the EU-27 Member States and the Associated States of FP6, particularly Switzerland, Norway and Israel, are researchers and institutions from Russia, China and the United States.
- In the survey, researchers involved in the FP cited cooperation with European and international partners as an important advantage of participating in the FP. Network contacts developed in the course of participating in EU projects are often subsequently used within the framework of other projects.
- German institutions also cooperate with one another in FP projects. More than one German partner is present in 62% of the projects involving German participation⁷. In the case of large-scale collaborative projects in the form of IPs and NOEs there is an average of four German partners and in the case of the special measures for SMEs an average

of approximately three German partners. This could possibly represent a ceiling to growth. In order to achieve a higher share of funding from the FP, the number of German participants in the projects would have to be increased further. However, this reduces the chances of projects being approved.

Application Procedure and Chances of Participation

- The greatest obstacle to participating in the Research Framework Programme continues to be the high level of oversubscription to the programmes. An evaluation of available information from the National Contact Points (NCPs) shows that on average fewer than one in five applications (18%) receive funding. Participants in the survey described the complexity of submitting applications, oversubscription, the cost and effort and the financial risk involved as particularly problematic. The chances of success differ in certain cases significantly according to programme area and funding instrument. Among the areas which are relevant for a broader research landscape, prospects were relatively good in the fields of TRANSPORT (26%) and HEALTH (25%) and poor in the fields of INCO (12%) and NanoMatPro (14%).
- Project applications involving German coordination have above average success rates. 23% of project applications with German coordinators succeeded in receiving funding, a significant five percent more than the average rate in FP6. Researchers stated in the survey that assuming the task of coordinator was relatively time-consuming („more project management than research“), but that it represented a significant boost to the image of the institutions and scientists involved.

Stakeholders in the Research Framework Programme

- German participants decide strategically on involvement in the FP. Interviews and the

broad-based survey of scientists involved and not involved in FP6 showed a differentiated picture with regard to the perception of both chances and problem areas. On the one hand, scientists emphasized the generous funding of the projects, which enables the realization of complex projects, as a positive element – providing one is awarded the contract for a project. On the other hand, the substantial administrative burden of project management – particularly as coordinator – is considered to be especially problematic. This applies in particular to IP and NOE collaborative projects and large STREP projects, which involve an average of 25 to 30 partners from 12 countries and where the official project language English is a foreign language for most partners. Various funding alternatives (Federal Government, Länder, EU) are used path-dependently. This means that positive experiences lead to repeated applications and funding, and established networks make further cooperation more probable.

- Large, export-oriented companies as well as companies in the field of cutting-edge technology and the knowledge-intensive service sector are more likely to take part in FP6 than in federal or Länder programmes. The European and international focus of the Framework Programme is thus particularly attractive for companies in sunrise sectors.
- A closer look at the relevance of the different funding alternatives reveals clear differences between people with or without experience of participating in the FP. Successful applicants consider the relevance of the FP to be similar to that of national funding programmes and to be higher than that of other EU and international funding programmes.
- Both participants and non-participants are critical of the unfavourable cost-benefit ratio for applications to the FP compared with national and other European or international programmes. Particularly as a result of the

⁷ Without „Human Resources and Mobility“ (Marie Curie).

need to work in international consortia, the submission of an application entails considerably more work and the application phase is significantly longer. This is virtually prohibitive in the context of the oversubscription of the calls and the resulting relatively slim chances of success.

- Of the scientists questioned, approximately a quarter of the participants and approximately 30% of the non-participants consider that more extensive counselling services would lead to more applications.
- Participation in FP6 promotes the success of R&D projects, stimulates involvement in international research networks and enables and accelerates the performance of additional R&D activities in scientific institutions and companies. Participation in FP6 has a variety of effects as far as stakeholders are concerned:
 - **Networking:** Numerous qualitative effects, particularly with regards to the opportunity to link up with excellent research institutions in order to conduct joint research projects. Cooperation with other excellent institutions in Europe is a significant motive for participation in the FP.
 - **Scientific output:** Scientific personnel state that a substantial part of their publications and patent applications are due to their participation in the FP. The projects thus have a positive influence on scientific productivity.
 - **Upcoming young scientists:** The FP offers good opportunities for supporting upcoming scientists. On the one hand, young scientists are involved in international research networks and on the other hand, they have the opportunity to perform research at foreign institutions within the framework of mobility programmes. In particular, universities

and non-university research institutions emphasize the opportunities for supporting young talent through participation in the mobility programmes.

- **Opportunities for companies:** Companies cite access to foreign markets as an important reason for participation. They also emphasize the positive aspect of networking with universities and research institutions. Participation tends to have a positive effect both with regard to the extent of their own R&D activities and the commercial success of innovations.

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