

Germany and the European Research Area

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Executive Summary

This report is an account of the relationship between the ERA development and German research and innovation policy (R&I policy). The report introduces what ERA is and how the activities and instruments at European level have fundamentally changed and broadened. It provides a discussion of key initiatives at European level and their inter-relation with German R&I policy.

In the last decade, and accelerated in the recent years, the European research policy and subsequently the innovation policy have undergone dramatic changes. A range of long-term ambitious initiatives have been developed, most notably within the path-breaking ERA process (research) and the Lisbon strategy (growth). This report addresses these developments by differentiating between traditional (Framework Programme, EUREKA and COST) and new instruments. The new instruments deviate from the classical cooperation funding by addressing either excellence (ERC, EIT) or coordination issues (ETP, ERA-Net). Moreover, also at European level research is no longer a stand-alone approach. Instead, innovation has gained rapidly in importance as a key driver for economic growth. In this report, we present evidence from document analysis and expert interviews for the merit and challenges of the instruments in general and in particular with respect to Germany.

In general, we conclude that EU level policies and strategies in research and innovation policy are of crucial importance for the development of the research and innovation system in Europe. The ERA delivers improved opportunity structures, whereby extra European collaboration still appears as a great gap. However, those increased competencies and the intensity with which new initiatives are brought forward by the Commission bear the risk of supra-national centralisation even when coordination is intended and thus undermining the possibilities of bottom-up coordination in variable geometry schemes. Further while the variety of new instruments and approaches to exploit new forms of cooperation and coordination across Europe is – in principle – fit for purpose, there is a danger of over-complexity. Many of the approaches are not yet fully shaped and equally, key approaches like the Innovation Partnerships and Joint Programming will necessitate a combination of existing approaches at national and European level that will be challenging. And finally, as postulated by any assessment of European instruments in the last decade or so, application and funding provisions yield a highly bureaucratic effort and thus pose a systematic entry barrier.

Reflecting these European level developments, our conclusions for the German research system are positive in the following respects:

1. Overall, the participation in European instruments results in net benefits for Germany. Moreover, financing R&D through structural funds is a big change and seems to work fine in Germany. Germany profits from introducing Lisbon priorities into structural funds.
2. Perhaps the most important benefit for Germany remains the improved opportunity structures for national researchers as a catalyst for international collaboration. Participation is therefore not a hobby horse or simply a matter of “money back”, but of important national interest. More particular, German participation and representation in most of the new instruments is leading in Europe (ERA-Nets, EIT, and partly for ERC and ETPs).

The EU level developments have moreover fundamental implications for national policy and policy-making. Before ERA, the policy of optimising participation in the framework programme, in order to

secure a financial neutral return flow or even net benefit, could be regarded as sufficient. However, the ERA-developments and the process of internationalisation and Europeanisation of research and research funding require more: National governments need a strategy, i.e. clearly defined goals and an approach on how to achieve them, e.g. in particular the creation of win-win situations for national and European actors, the combination of national and European goals and approaches, the mobilization of adequate representation at European level, the coordination among national ministries and funding bodies and the mediation of interests articulated by stakeholders in particular within public research (in Germany mainly DFG, Universities, MPG, FhG, HGF, WGL).

We find that while there is no explicit strategy towards ERA, Germany has developed in the last years a strategic thinking and action towards the ERA. There is a strong involvement of national policy makers into European issues, a clear improvement to earlier years. EU level instruments are being used for national goals, and there are attempts to influence the European level policy with principle ideas of the Internationalisation Strategy and Hightech-Strategy. Triggered by a broadening of R&D policy and innovation policy at EU level, there have been steps towards a more functional “horizontalisation” at national level, i.e. European involvement is becoming part of the strategic thinking and there is a stronger awareness of European issues across all ministries (e.g. visible in ERA-Net participations).

However, there remain several challenges when it comes to maximise the benefits of the ERA development for Germany and contribute to an optimised ERA development. Not all of the them can be addressed by the German Federal government exclusively, however, it can take a leading or supporting role. National governments for example need to join forces in order to react to the centralising character (“magnetism”) of Commission initiatives, and in order to address the danger of an over-complex and unwieldy instrument landscape by promoting consolidation of the instrument landscape and systematic evaluation, and thirdly to promote the internationalisation of the ERA, and finally to further pursue the simplification of application procedures. Further issues could be remedied at national level. In Germany, for example more specific analysis is needed in order to find out which groups are structurally at a disadvantage of application procedures and to subsequently target special support for EU applications to them. Finally, the most recent ERC participation statistics underline again that German host institutions are less attractive to international researchers. Universities and research organisations have to do their homework here, but the Federal government and the Länder governments have to make sure that framework conditions for career, working and living such as contracting, payment, social security and similar offer flexibility to the needs of international researchers

The old times of clear division of labour between what is European and what is national in research and innovation policy are gone for good. There is no alternative for German policy to the capturing of the opportunities that lie in a more coordinated European Research Area, especially as it turns into a Research and Innovation Area. The continuous challenge will be to work towards the right balance and synergies between national, internationally coordinated and supranational policies and instruments. To do so, policy makers, administrations and other stakeholders across Germany need to continue constructive dialogue and engagement as well as improve monitoring, analysis and reflection for decision making in an increasingly complex world.

1 Introduction

This report is an account of the relationship between the ERA development and German research and innovation policy (R&I policy). It is based on extensive document and literature review and a set of interviews.¹ It also draws on multiple involvement of the authors in ERA and research policy studies over the last 10 years. The report introduces what ERA is and how the activities and instruments at European level have fundamentally changed and broadened. It provides a discussion of key initiatives at European level and their inter-relation with German R&I policy. This involves comments on:

- the governance relation (influence at EU level, coordination within Germany);
- how Germany takes advantage of the various initiatives²; and,
- how EU initiatives shape German strategies and priorities (and vice versa).

A report based on a short term literature and interview programme cannot claim to discuss or analyse all those issues in necessary breadth. However, it delivers a holistic picture of the interplay of ERA and the broadening innovation claim at EU level and national policy. It does not do justice to the multitude of strategic activities of German stakeholders at European level, but rather concentrates on the national policy level.

The report is structured as follows. It starts with a short summary of the major changes within ERA and the more ambitious approaches at EU level for research and innovation (Chapter 2) and how those changes have to influence our assessment of relations between the national and the EU level. It then discusses the role of German actors and policy within a set of most important cornerstones of R&I policy at European level (Chapter 3), describes and assesses what those instruments and initiatives mean for Germany, how German actors participate and influence them and finally the ways in which those EU measures influence national agendas. Chapter 4 then broadens the agenda to innovation initiatives at EU levels and the increasingly important role of R&I financing out of structural funds. Subsequently, the report discusses – horizontally – strategic initiatives in Germany and how they link up with the EU level (*mainly Hightech-Strategy and Internationalisation Strategy*). A final chapter summarises the governance challenges and assesses the overall linkages of EU level initiatives and German R&I policy.

It is the aim of this study to arrive at a set of most relevant (but not complete) conclusions from the exercise of linking up European level developments and German activities. The chosen point in time for this stocktaking could not be better, both in view of the speed and broadening of European level developments as well as the steadily growing opinion among all types of national stakeholders about how relevant the European dimension of R&I policy has become.

¹ See the annex for the experts interviewed.

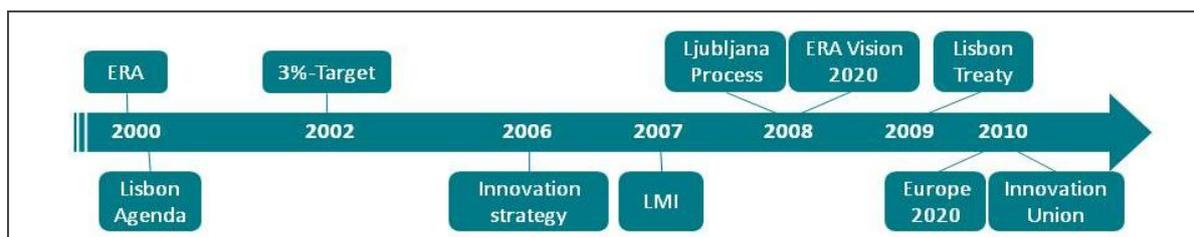
² This does not involve a quantitative analysis of participation, this aspect is covered by the on-going study of ZEW for EFI (ZEW 2011).

2 The bigger picture – Germany in a dramatically changing Europe

A traditional picture of the EU level in German research policy

To the observer of German R&I policy “Europe” has long been a welcome additional element for national R&I policy. Most importantly, Germany has (as with other countries) for decades tried to optimise participation in the Framework Programme, provide support at all levels to scientists and firms to enable them to best participate. The country has negotiated thematic priorities and tried to influence working programmes of the FP. In addition, German firms and scientists have played an active part to support EUREKA and COST participation and German government officials and agencies have supported COST and EUREKA accordingly. Those activities and development have routinely had their place in the former account of the government on research policy (Bundesbericht Forschung), in which structures, participation and general activities were reported (see e.g. BMBF 2006). With hindsight, this was more focused on participation and influencing thematic priorities and those previous accounts do not show a clear sense of strategic interaction between national policy and EU policy.

Figure 1: Development in European R&I Policy since 2000



Source: Own compilation.

The comprehensive changes of ERA

However, as Figure 1 shows, over the last decade, and accelerated in recent years, this picture has dramatically changed, a range of long term, ambitious initiatives have been developed, most notably within the path breaking ERA process (research) and the Lisbon strategy (growth)³. Those changes have fundamentally altered the relation between the national and the EU level and research and indeed innovation policy. Up to 2000, the landscape of research in Europe was seen as scattered and divided, with an EU Framework Programme supporting small scale cross-border projects, a small set of joint research centres, limited EU involvement in other European programmes⁴ and strong and largely closed national research policies.

In the year 2000, the Commission coined the concept of a “European Research Area” (“Towards a European Research Area”, European Commission 2000). In essence, the ERA approach was a wake up call for a step change in how the research landscape in Europe should be organised and governed, in order to improve its performance. It coincided, and only much later was linked to, the

³ One could further mention the Bologna Process in Higher Education, which in some parts (mobility of researchers and academics) is linked to ERA, but is not within the scope of this report.

⁴ See sections 3 and 4 of this paper.

growth oriented Lisbon agenda. The overall ERA idea was to do away with a traditional multi-layer governance of research in Europe, and to provide a more holistic ambition. First, the concept set out a range of national goals (e.g. the famous 3% R&D/GDP Barcelona goal) that hitherto served to mobilise national policy to develop in certain direction. This is an important step-change as it commits national policy to EU goals without providing specific EU instruments. Second, the ERA concept aimed at establishing large scale, longer term research projects within the Framework Programme sought to enable self-governed integrative structures in Europe. Third, it supported the networking of firms and research organisations beyond individual FP projects to define and co-finance long term strategic research programmes in specific technological areas (Technology Platforms and Joint Technology Initiatives). Fourth, it aimed to promote a tighter co-ordination and cooperation among national research policies and programmes, through the establishment of indicators, benchmarking exercises, mutual learning schemes of policy-makers (OMC-NET) and co-ordination schemes of programme owners and managers (ERA-NETS, Inco-Nets) that led to various forms of integrated calls between variable set of countries.⁵ The idea of variable geometry has been deepened with Joint Programming Initiatives to design new funding programmes between a set of countries (and the Commission). Sixth, the Framework Programme 7 has also seen institutional innovations on the research and innovation side, as European Research Council (ERC) for the first time supports basic research⁶ solely based on excellence without any requirements for transnational cooperation of applicants and the European Institute for Innovation and Technology (EIT) offers co-funding of strategic relationships of Universities and firms across Europe. In this context, the ERA is also anchored in a set of renewed rationales for research in Europe such as the freedom of mobility of knowledge (the “fifth freedom”) both in terms of scientists and in terms of data (see 2020 Vision for ERA, Council of the European Union 2008). Finally, the ERA is to be realised through a more coordinated governance between Commission and Member States. With the Lisbon Treaty and its Article 181 the so-called Ljubljana process was finally codified, i.e. the specific request that EU level and national level shall in future coordinate policies on research and technological development to ensure consistency. Moreover, for the first time, the Lisbon Treaty defines the distribution of competences between the EU and the Member States in the areas of research, technological development and space as a shared competence. This includes the following qualification: “*Union exercise of competence shall not result in Member States being prevented from exercising theirs,*”⁷ however, the Commission can launch any initiative it likes, and de facto uses this increase in competence.

Not only was there dynamic institutional development, but the rationales for funding also has begun to change – and with it the relation of research to innovation at EU level. Starting with the Aho report (Aho et al. 2006) the discourse on European funding is more and more orientated towards so-

⁵ One key element of coordination was the famous 3% goal, whereby all countries in the EU should aspire to spend 3% of the GDP on research.

⁶ The idea is to fund „frontier research“ which is characterized not only as early stage (basic) research, but also as bearing a high risk of failure and crossing the borders of traditional research fields (not only interdisciplinary, but opening up new research disciplines).

⁷ Art. 4 (3) of the Consolidated version of the Treaty on the Functioning of the European Union, Part One: Principles, Title 1: Categories and Areas of Union competence.

called Grand Challenges, with the call for integrated approaches that combine funding with institutional framework conditions, demand conditions (and more explicitly public procurement) and innovation policy support to tackle those challenges more comprehensively. This debate links back to the Lisbon growth agenda. It shifts funding debates to societal issues and Lead Markets (as demonstrated by the Lead Market Initiative (LMI) of the Commission adopted in December 2007) rather than technologies or knowledge areas. It also calls for a re-thinking of strategic division of labour between policy levels, not driven by thematic priorities along technologies, but – ideally – determined by synergies and bundling effects between policy levels as requested by the nature of specific challenges. In accordance with those rationales, the meaning of innovation measures and instruments at European level have been re-enforced and broadened. In the Structural Fund (SF) much larger share of budgets are earmarked for research and innovation measures. In addition, as a consequence of the first Innovation strategy in 2006, the Competitiveness and Innovation Programme (CIP) of the Commission was established in 2007 that also is supposed to serve as a catalyst for national and regional measures on innovation to improve innovation, productivity, and sustainable growth within three pillars (entrepreneurship, ICT and energy).

Internationalisation and Europeanisation of strategic actors

These policy and governance developments have gone hand in hand with a growing trend of international cooperation and mobility in research, both within Europe and beyond, whereby not only individual researchers (Cox et al. 2008, Frietsch/Jung 2009) and firms (Shapira et al. 2009), but national research and indeed funding organizations have developed internationalization activities and explicit strategies (Ebersberger/Edler 2009, WR 2010). The main bodies representing funding and research (such as DFG, MPG, FhG etc.) have their own European strategies and positions (Ebersberger/Edler 2009) which are in the meantime re-enforced by the “Pakt für Forschung und Innovation”, see also WR 2010). This has raised awareness in the actor landscape across Germany as to the importance of EU policy and institutional developments. This also means that the relation between Europe and Germany in terms of governance and policy is not confined to ministries, but includes funding agencies and large research organisations in more pronounced ways than used to be the case 10 years ago, making an official “German” position and strategy more comprehensive, but the co-ordination also more challenging.

Changing roles and changing ambitions of national policy....

Against this background, any discussion of the relation between European and German R&I policy must take into account, the strategic role of the European level for German policy and vice versa has changed significantly. As for any Member State, German EU policy in R&I is not so much limited to the question of return on investment, but rather seeks to support the mobilisation of European resources for national actors. Thus, in contrast to earlier reports on the role of Europe for national policy as cited above, the latest report on research and innovation (BMBF 2010a) as well as the interim report of the internationalisation strategy (Bundesregierung 2009) both paint a much more complex, inter-linked and strategic picture. It is now also about the participation in new governance schemes and variable funding arrangements. It is about the ways in which governments engage with

those developments, create win-win situations between the national and European level, link EU goals and budgets to national strategies, goals and instruments intelligently and to enable actors at all levels and across research *and* innovation to engage in schemes as they for themselves see fit. It is not a maximization of participation in programmes alone, it is the mobilisation of adequate representation in and shaping of increasingly complex multi-level concertation in Europe. And it is also about the ability to coordinate horizontally within national governments and across other stakeholders in order to react to and influence European agendas. In a nutshell, rather than react to, and exploit, European schemes, member states are required to actively (and pro-actively) position themselves and develop strategies how to deal with the European dimensions of R&I policy. These new realities also determine how one assesses the link of EU and national level policy in R&I and the meaning the EU level has for national policies and policy goals.

...and more to come

Judged by current strategic policy ambitions at highest level, the outlined development towards more concerted action across R&I in Europe will further proceed. Europe has formulated an economic and societal vision for Europe, the Europe 2020 strategy.⁸ As for R&I, one key pillar to achieve this is the “Innovation Union”, which essentially is a very comprehensive attempt to bring current developments together, make research *and* innovation an essential part of EU policy across the board of EU policy, integrating ERA (which already *explicit* part of the Lisbon Treaty) with a broader innovation approach linked to grand challenges and governed by a new multi-level, multi-stakeholder governance architecture. This has severe challenges for the governance at EU level – which needs to be able to steer across compartmentalised policy areas and institutions.

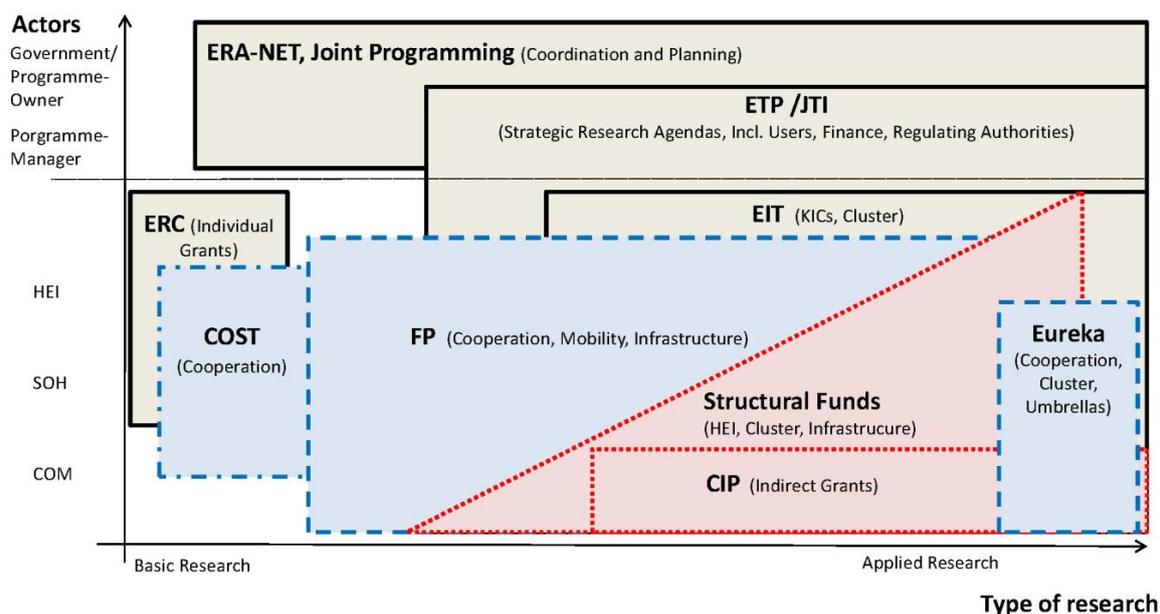
For example, it is conceivable that the means of coordinating via negotiated agreement (Selbstverpflichtung) to quantitative goals (as has been done with the 3% goal) will be promoted by the European Commission also in the future. For example, there are discussions about the share of national programme funds, which should be ideally coordinated with other Member States at the European level. Other attempts are directed towards a quantitative definition of critical mass, which would underpin in a numerical sense the rationale for European level efforts in research policy. Naturally, the ways in which national governments can react to and influence those dynamics is dependent on their ability to coordinate horizontally as well, a challenge that already puts pressure on national governments and will continue to do so (in this sense the Hightech-Strategy is good as it already tries to coordinate horizontally). Moreover, it requires, a concertation of approaches with other national governments, early-stage networking in policy-making processes. The current German national policy initiatives and strategies as well as coordination mechanisms have to be assessed against this background.

⁸ For documentation on the EU 2020 strategy see http://ec.europa.eu/eu2020/index_en.htm.

3 The various initiatives and instruments within ERA

The topic of this and the following chapter is how the enormous development of ERA and innovation related policies appear at the instrument level. Figure 2 displays the developments of the programme landscape along two major dimensions. On the horizontal dimension, it shows the type of research addressed by the instruments, ranging from basic to applied research. The vertical dimension displays the different actor groups involved by an instrument with the main distinction between researching actors (three different groups in the lower part of the chart) and policy actors, i.e. those responsible for research funding programmes (in the upper part of the chart). This is a highly stylised way of illustration, with a very rough estimation of the type of research addressed and a very limited actor typology (with the size of planes being determined by the diversity of actors and research the instruments address, but not by their importance). The instruments highlighted in blue colour (and dashed lines) are the traditional cooperation funding instruments (see section 3.1). The changes to the instrument landscape brought about by the ERA are displayed in grey (with straight lines). They show that the new instruments deviate from the classical cooperation funding by addressing either excellence (ERC, EIT) or coordination issues (ETP, ERA-Net), which also involve actors outside research (see section 3.2). Finally, the innovation programme (CIP) and the use of Structural Funds for R&D completes the picture (see chapter 4).

Figure 2: Developments of the European R&I policy landscape



- Legend:
- CIP - Competitiveness and Innovation Framework Programme
 - COST - Cooperation in Science and Technology
 - COM - Company
 - EIT - European Institute of Innovation and Technology
 - ERA-NET - European Research Area Network
 - ERC - European Research Council
 - ETP /JTI - European Technology Initiative/ Joint Technology Initiative
 - FP - Framework Programme
 - HEI - Higher Education Institutions
 - SOH - Science and Research outside Higher Education Institutions

Source: Own compilation

3.1 Traditional instruments – FP, EUREKA, EUROSTARS and COST

3.1.1 The Framework Programme 7 in its core business: funding collaborative projects

The Framework Programme is by far the most important pillar of the EU research policy. It is the umbrella for the supporting actions, and its major means is to fund transnational collaboration projects within thematic programmes. The current EFI report by ZEW (ZEW 2011) covers the structures, processes and financial developments and breakdowns of the FP and also the participation of German actors in more detail. For the purpose of this report we concentrate on a general argument around the overall benefits and impact of the Framework Programme and the interaction between German research and funding landscape and the FP.

The Framework Programme has gained relative and **absolute significance** throughout its almost 30 years of existence. Its major benefit is still to enable transnational collaboration of firms and institutes in Europe to do application and solution oriented research. This is linked to EU goals through thematic priorities that are derived from those goals. Thus, while the thematic programmes are a compromise between EU suggestions and Member State priorities, the basic principle is contributing to EU goals. This is important and constitutes an added value of this research that is often underrated, as the joint goals are shared by the Council and thus by the MS. At EU level, the international peer review concluded that “it is clear that FP6 reflects a significant consensus in the RTD community about what is important and that it has tackled this agenda at significant scale and quality,” (Rietschel et al. 2009, p. 46). It is then, subsequently, a matter of national strategy to align national themes to the FP, either by supporting the same areas (to strengthen mutual interaction and benefits) or by avoiding to fund similar application oriented research and focusing on gaps or by largely ignoring priorities at EU level for national thematic priorities.

As regards **thematic priorities**, Germany appears to have a selective strategy, clearly determined by nationally defined priorities.⁹ Some areas have a similar share of national and EU budgets respectively, such as genome and biotech, nanotechnology and new materials. In information technologies there is a much higher share within the FP than at national level (twice as high). The BMBF obviously invests more heavily than the EU level in research infrastructure and in thematic areas such as environment as well as science and society and SME support. The EU has specific transnational activities such as support of mobility across Europe (Marie Curie) that take a large share of the EU budget, much more than equivalents at German level. While German actors – as those from other countries – bring in national priorities in the working programmes, there is no obvious adjustment of national funding priorities and shares because of budget availability at the EU level.

An issue of crucial importance when assessing the meaning of the FP is the **quality of participation and the research undertaken**. While the EU FP often is labelled as less excellent research – mainly due to its more application oriented nature – it has become obvious that the funding of collaboration in the FP is not a funding of second best, participation in EU programmes is an indicator for and a promoter of more excellence. A bibliometric study on the FP participation

⁹ Underlying data received by ZEW, based on ZEW impact analysis of the EU participation (ZEW 2011).

(Technopolis 2008) indicated that the lead scientists in the FP have better publication profiles than peers not active in the FP, and the interim assessment panel therefore concludes that, in sum:

“the available evidence suggests that FP assessment procedures, the high level of competition for FP awards, and the widespread use of FP participation as a ‘seal of quality’ at national level has combined to attract the participation of some of the best researchers in Europe, contributing in turn to ensuring that the work performed will be of high quality,” (Rietschel et al. 2009, p. 39-40).

As for funding, the FP is a cornerstone of the funding landscape in Germany. The ERAWATCH country report for Germany¹⁰ finds that the grants from FP 6 add up to 20%-25% of the annual budget for project funding of the Federal government. The increase in international collaboration in the last 2 decades (see Edler 2007; Frietsch/Jung 2009) is to a large degree connected to this relative importance of EU project funds.

As for participation and relative success of German actors, relative importance of Germany in the FP, the picture is mixed. Germany has a **neutral financial balance** (in terms of financial net returns), the country does slightly better than France and even the UK (if the British rebate is discounted for), it does, worse than smaller countries such as Sweden, Netherlands, Finland. Those latter countries also have a slightly higher success rate than Germany (Rietschel et al. 2009, p. 20). However, and interestingly, the average contribution per partner is highest for German partners. This reflects the importance of German partners as coordinators in projects (ZEW 2009, p. 46). Combined, this tends to increase the influence of, and benefit out of, projects. In addition, German industry is highly active, the share of industry is 24% and only higher in France (Rietschel et al. 2009, p. 23), thus industrial benefit is spread.

The **relative meaning and the impact of the FP** for Germany is high and not disputed. The impact assessment of FP 6 found that overall the participation in the framework programme has significantly increased the innovation strength (“Innovationskraft”) of German firms, as indicated, inter alia, through a higher share of innovation turnover by supported firms and higher R&D intensity¹¹ (ZEW 2009). For scientific organisation the benefit is also reported to be high, especially when it comes to international collaboration effects, better financing of young researchers (additional sources for that) and access to further funds (ZEW 2009, p. 76). Especially for public scientists the networking with (international) companies is a further benefit. **Room for improvement** of the FP instrument more generally is clearly in the outreach to non EU actors. An analysis of the international participation within FP 6 finds that the mobilisation of extra-European actors to complement projects and ease access to global knowledge and markets is underdeveloped (Edler 2008). This shortcoming, it seems, is partly tackled through schemes of variable geometry across Europe (ERANET), see below.

In addition, two broad surveys of individual scientists and of universities and research organisation (Edler 2007) have clearly demonstrated the importance of the EU Framework Programme not only as funding tool, but as **catalyst for international collaboration**. For example, those research

¹⁰ See the online version at <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&topicID=625&parentID=21&countryCode=DE>.

¹¹ Whereby the latter indicator at the same time signals that more technology intensive companies are more likely to participate in the first place.

organisations that are actively engaged in EU funding are at the same time more international in their activities in terms of cooperation, internal support structures etc. EU participation and international activities are mutually re-enforcing (Ebersberger/Edler 2007, p. 214); this is true also for the individual level. However, that study also found a big gap in the European funding (which is not sufficiently closed through national sources), i.e. the **lack of opportunities to collaborate with extra-European players** and the need to be fitting into the thematic working programmes (Ebersberger/Edler 2007, p. 217).¹² Further, the **funding conditions and bureaucracy** of the EU was assessed as being a real challenge for scientists. This issue has been reaffirmed by the recent FP6 evaluation, pointing to the fact that in particular applications require large capacities: “The complexities of the application and contractual procedures raise significant barriers to entry at the proposal stage, especially for first time applicants, be these research groups, firms, or organisations from new Member States,” (Rietschel et al. 2009, p. 59).

The German government in its position paper to FP 8 (BMBF 2010b), coordinated and represented by the BMBF, assesses the FP to be a cornerstone of the ERA. Its position favours a more integrated approach (e.g. stronger link to the innovation activities of the EU¹³); a strengthening of the mission orientation of the research funded and measures to improve the knowledge and technology transfer from the programme. In fact, the broad approach to integrate a whole range of instruments along specific missions resembles an export of key ideas of the Hightech-Strategy to the European level. It appears that the basic positions of the BMBF are in line with the latest developments (European Commission 2010a).

3.1.2 EUREKA, EUROSTARS and COST

Eureka and COST are initiatives which exist at least as long as the Framework Programmes (Eureka since 1985) or even much longer (COST since 1971) and involve a larger group of states in- and outside the EU. Both activities complement the FP as regards support for research along the economic value chain: Eureka stresses the application aspect by supporting the development of innovative products, processes or services, while COST is the counterpart for the pre-competitive stage by supporting basic research projects. Both instruments **do not provide direct funding**. Eureka provides its ‘label’ to projects which support partnering and access to foreign markets, while the project partners have to apply for national or other funding separately. Projects can be proposed bottom-up by researchers and the programme is thematically open, projects are often small-scale in terms of the number of involved partners and duration. COST works quite similar (see for more BMBF 2010a, p. 357ff.) Since 2005, **EUROSTARS** is a part of Eureka. It is a variable-geometry initiative by 32 states following Article 185 TFEU (ex Article 169 TEC) with the aim to enable R&D-performing SMEs to improve performance through its support of “in-house” research. Further pillars of Eureka are cluster and umbrella initiatives.

¹² The need to open up to international cooperation is also stressed in the mid-term evaluation of FP 7 (Annerberg et al. 2010, p. 53ff., 73).

¹³ This is meanwhile suggested by the Commission through the Innovation Union communication (European Commission 2010a).

According to the most recent **evaluation** report available (2006), **EUREKA** continues to work well and has direct and indirect **socio-economic effects**. Almost two thirds of the projects have a clear market impact, and SMEs are particularly successful at bringing their products rapidly to the market. A most recent study shows that time to market for products out of EUREKA projects is about one year after project completion (Bayona-Sáez/García-Marco 2010). Moreover, “prestige effects of the EUREKA label are helpful to give smaller firms a foothold in the market and visibility to investors (Georghiou et al. 2006, p. 4).” The success of projects is clearly linked to support by public funding and to international collaboration. At the start of its Eureka presidency 2009/2010 the German Federal government has launched a study dealing with more **strategic questions and challenges** of the instrument, in addition to reviewing the views of beneficiaries in participating in EUREKA. This includes the need to overcome short-term agendas by annually changing presidencies, a positioning in the changing landscape of EU R&I policy with European Technology Platforms and Joint Technology Initiatives (see below) which pursue similar objectives like Eureka clusters and umbrellas, and a further opening-up towards non-EU partners (Delta/Prognos 2009).

In mid-2010, there have been 691 active **Eureka projects** (at the total volume of 1.25 bill. €), among them are 96 running with **German participation**, which corresponds to 14% of all projects, and a volume of 224 mill. € (18%).¹⁴ These shares are equal to the ones found for participation in FP6 (ZEW 2009, p. 7).¹⁵ Germany has also taken over the secretariat of EUREKA PROFACTORY (production research), which was possible because of a flexible budget of the Research Ministry’s department for European and international relations, which shall facilitate participation at European level activities.

An **evaluation** of COST and German participation found evidence for positive effects of the scheme, most notably access to new partners and sustainable research networks (Technopolis 2010). With respect to its role within the European programme landscape (Framework Programme, EUREKA, ESF programmes (Eurocores, Research Networking Programmes)), it is judged to be **complementary**, e.g. for the following reasons: (1) COST networks have a larger geographical coverage, beyond EU and EFTA; (2) COST has no thematic priorities and is therefore more open (although COST has over time been also successful in influencing the thematic agenda of the Framework Programme); and, (3) the majority of COST projects are expected to contribute to a coordination of measurement techniques or to norm and standard setting. Application procedures have been changed in 2006, which is partly welcomed and partly criticised by the beneficiaries and the study team.

Between 2004 and 2009, **national participation** in COST activities was led by UK with involvement in 775 activities, followed by Germany with 411. German involvement at the project level seems to be considerably high, e.g. for 2009 German researchers were involved in 215 out of 220 projects (BMBF 2010a, p. 360). Most involved research institutions (75%) finance their activities out of their institutional budget. In addition, the mid-term evaluation of COST has found that COST actions are also a gateway for non European researchers to establish networks with European actors, in a way a

¹⁴ Among them, 20 projects are running with public funding, which sums up to 12 million € (15% of the total project sum). Public funding is being granted to public research institutions (between 75% and 100% of the project sum) and to companies (co-funding of 50% of the project sum).

¹⁵ Source: Eureka Office at the DLR, <http://www.eureka.dlr.de/de/159.php> (Data of June 2010), see also ZEW study for EFI on participation (ZEW 2011).

cost effective possibility to reach out (ESF/COST 2010, p. 32). Based on this cost-effectiveness and on the above mentioned positive effects the evaluation study suggests continuing with the engagement in COST (Technopolis 2010, p. 3). This is in line with a recent assessment of COST which found the added value of an instrument that financed networking of existing projects across Europe and beyond to be of utmost importance in addition to FP projects. However, this evaluation also urged the organisations and the national ministries involved to clarify the governance of COST, especially to bring decision making power and financial responsibility more in line (Horvat et al 2010).

German policy makers value the merits of these established instruments. Within the increasing interest at European level into private R&D and the involvement of industrial and innovation policy into the ERA, they suggested to consider the positive effects EUREKA has generated in terms of mobilising private R&D budget and the innovative potential of industry-lead research collaborations (BMBF 2009, p. 1f). The German Federal government has also **strategically used its EUREKA presidency 2009/2010**. Germany has followed up its initiative for a European IP Charter (see below chapter 5) and was able to negotiate an agreement with the Korean government on IPR issues. Using its EUREKA presidency, the government had secured consensus among EUREKA Members (39 States plus the European Commission) about the issues on the table, which was a key factor for the success.¹⁶

3.2 New instruments and approaches at EU level

3.2.1 New institutions with excellence focus

The abovementioned innovations of funding and governance instruments in FP 6 and FP 7 offer new opportunities for stakeholders from industry, science and policy alike. At the same time, they produce learning and coordination costs. In the following, we discuss the major innovations shortly in relation to the German position and interest.

European Research Council: The ERC as new, European funding organisation for basic (or “frontier”) research both for researchers at the earlier stages of their careers¹⁷ (starting grants) and established researchers (advanced grants). Its annual budget will grow to 1.8 billion EURO in 2013 and thus represent truly considerable funds. The ERC appears to be highly regarded by the research community across Europe.¹⁸ Its overall mission and its merit in terms of providing additional funding for basic research and initiating excellence driven competition of individuals and their host organisations for funds across Europe is not contested anymore. The mid term review of a high level expert group conceded that the ERC has succeeded as pan-European instrument, it did attract outstanding scientists on its panel, was fully free in its evaluation procedures and generated spill over to national systems as results of the evaluation process in many countries are taken as basis for funding decisions. Criticism was raised over the autonomy of the management of the ERC in the long

¹⁶ Source: Interview partner from BMBF.

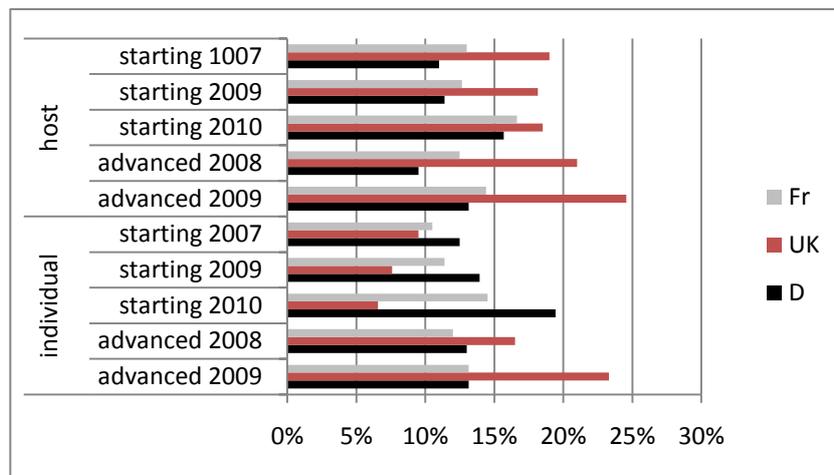
¹⁷ Whereby the definition of eligibility for starting grant is still flexible, the current Nobel Laureate in Physics (Konstantin Novoselov) was one of the recipients of a starting grant of the ERC.

¹⁸ This is, so far, based on the mid term review of the ERC (Freiberga et al 2009) and anecdotal evidence in the EU project EURECIA, in which impact assessment concepts for the ERC are designed and in doing so opinions of stakeholders gathered (<http://www.eurecia-erc.net/>).

run and the lack of flexibility through grants (rather than research contracts) (Freiberger et al. 2009). The mid-term evaluation of the FP7 found moreover, that “a significant share of all applicants have been working in the US, indicating that the programme is having an effect on attracting top researchers back to Europe,” (Annerberg et al. 2010, p. 35).

The participation of German nationals and scientists at German host organisations shows an interesting picture when compared with the two other large member states countries: France and UK (Figure 3). Strikingly, the share of grantees at German host organisations is far lower than UK and somewhat lower than for France. For individuals, the share of German nationals is highest for starting grants but considerably lower for advanced grants.

Figure 3: ERC Grantees per host organizations and individual nationality, percentages



Own compilation, source: various statistics in ERC, <http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=165>.

This signals poor support structures within organisations to establish best conditions for applicants but also, more importantly even, serious lack of attractiveness for highest level talent, room for improvement as regards working and funding conditions in German research environments,¹⁹ as clearly the ERC establishes itself as a new benchmark for research excellence in Europe (see also WR 2010, p. 108-109). It also indicates the quality of younger German researchers.

Although some stakeholders in Germany had initial reservations (e.g. DFG) in the early discussion about the ERC, the funding organisations, together with Universities (HRK 2009) and the BMBF, positioned themselves in support of the ERC and pushed for its establishment as an autonomous, self-regulated organisation, acknowledging the positive impact for the competition and excellence of the European Research Area. In terms of governance, the BMBF and the DFG coordinate their support for applicants within Germany in a new joint structure. However, the DFG, unlike funding agencies from some other countries, does not automatically fund those proposals that have been ranked in the ERC, but did not get funding.²⁰ There is consensus among all stakeholders, along with

¹⁹ This issue has been considered by EFI in its 2009 report.

²⁰ The Wissenschaftsrat in its document on science policy in the ERA advises DFG not to go down that road, but consider a fast track system for those ERC cases (WR 2010, p. 115).

the recommendation of the ERC mid-term review, that the autonomy of the management body of the ERC must be secured and further improved (see also WR 2010).

European Institute for Technology: The EIT’s mission addresses shortcomings in knowledge transfer between excellent education and research institutions and business. It “is the first European initiative to integrate fully the three sides of the "Knowledge Triangle" (Higher Education, Research, Business-Innovation).”²¹ The EIT finances support structures for knowledge transfer and networking by funding virtual “Knowledge and Innovation Communities (KICs)”, being organised as public-private partnerships. A strong EIT Governing Board shall ensure implementation of major strategic goals. There is an incremental approach for setting up the KICs, with the first three now being in place.

During its **Council presidency** in the first half of 2007, the German Federal government has chosen the **specification of the EIT and the KICs** to be one of its priorities. While the Commission favoured setting up the KICs by inviting excellent institutions and companies to create and enter new networks, the German Federal government made the alternative proposal to build the KICs out of existing excellent clusters instead of establishing new structures. With this proposal they were **successful** (BMBF 2008a, BMBF 2010c). The German government links to the EIT strong expectations, in particular as regards **researchers’ mobility** and the possibility to attract skilled personnel from abroad to work in Germany (BMBF 2007, p. 26f.). From the perspective of the German Federal Economics Ministry, it is been seen as the most ambitious innovation policy approach currently (BMW 2010, p. 3). Successful actors and in particular clusters, which receive national funding (e.g. from the Top Cluster Competition) are allowed to receive EIT funding additionally.

Table 1: German representation and participation in the EIT

EIT Governing Board (18 members) Prof W Herrmann, TU Munich President Dr. P. Tropschuh –AutoUni – Volkswagen		
Climate KIC (partners from 9 nations) Academic Partners: PIK, GFZ, TUB, TUM Corporate Partners: Bayer, SAP, SolarValley Mitteldeutschland*	EIT ICT Labs (partners from 5 nations) Academic Partners: FhG, DFKI, TUB, MPG, Saarland Univ., CASED*, KIT, TUM Corporate Partners: Telekom, Siemens, SAP, EICT, Opera	KIC Inno Energy (partners from 6 nations) Academic Partners: KIT**, DLR, Stuttgart Univ. Corporate Partners: EnBW, MIRO, Intel, SAP, and others
* Two German Top Clusters (Spitzencluster) also successful in KICs. ** Consortium leader. Source: See for full lists of Governing Board and KIC partners http://eit.europa.eu/home.html .		

²¹ See self-description at <http://eit.europa.eu/about-eit/at-a-glance/eit-mission.html>.

The results of this policy are visible in the German **representation and participation** in the EIT. As Table 1 shows, 2 of 18 Governing Board members are German. Moreover, German actors (“co-location centres”) are represented in all three KICs. Only France and the Netherlands have a similar representation. Among the successful clusters, there are also two German top clusters. Moreover, the Karlsruhe Institute of Technology (KIT) acts for the KIC Inno Energy as a consortium leader.

It is too early for an impact assessment of the EIT. As for its future, the German Federal government opts for a continuity of the EIT and prefers to structurally integrate it into the FP, as one of the specific programmes and including an adequate financial allocation to that programme (BMBF 2009, p. 11). This is also recommended by the Science Council (WR 2010, p. 106.)

3.2.2 New ways of transnational joint up funding and coordination

In recent years, major progress has been made in terms of new ERA instruments, so that the Rietschel review of FP 6 concedes that in relation to ERANETS, Technology Platforms, Open Method of Coordination etc. “the views of policymakers and implementers appear to have changed considerably. The ETPs are successfully acting as trans-national ‘focusing devices’ that are likely to lead to changes in funding patterns,” (p. 51). It is fair to say that German stakeholders and policy makers have been a proactive part of this development.

3.2.2.1 European Technology Platforms (ETP) and Joint Technology Initiatives (JTI)

European Technology Platforms (ETP) have been introduced in the 2002 communication of the Commission on “Industrial Policy in an enlarged Europe”, which intended to pave the way for a stronger European industrial and innovation policy as a means to realize the ambitious goals of the Lisbon agenda. ETPs should bring together stakeholders (e.g. regulatory bodies, industry, public authorities, research institutes and the academic community, the financial world and civil society) in areas of major industrial relevance for Europe. Their major role is seen in enhancing science-industry collaboration and in developing long-term R&D strategies which address major technological challenges. The initiatives for ETP should follow a bottom-up approach, with the stages of setting up and **developing the strategic research agenda (SRA)** being financed either by EC funds, industry or membership fees. For the implementation activities of the SRAs, the ETPs are expected to raise private and public funding, meaning with respect to the latter that they are expected to influence public programming, in particular the priorities of the Framework Programme.

Within the ex-post evaluation efforts of FP 6, the Commission has most recently commissioned a separate **evaluation of the 34 existing ETPs** (Idea Consult 2008). The evaluation report concludes that the concept **achieves major goals**. Most ETPs involve the relevant stakeholders; however, it appears that end-users (consumers) and SMEs are less represented. The SRAs are addressing technological challenges, while considering also socio-economic challenges. Most stakeholders subscribe to the SRAs, however, would like to see more implementation activities. On the other hand, the bottom-up approach bears the danger of duplication of effort and fragmentation due to the large number of ETPs, despite the efforts of some ETPs to coordinate and develop common activities and working groups. There is some, but no significant evidence that ETPs were able to influence national R&D programmes. Influence on FP7 priorities is more visible, at least for some

ETPs; however, success rates of FP7 proposals were rather disappointing. There is a clear recommendation to **continue with the ETP scheme**, and Member States were encouraged to **set up national counterparts**. The study on the German participation in FP6 arrives at the same conclusion: “A similar instrument could be considered also for Germany, in order to reach at a better coordination with EU-relevant topics and to identify new research areas with high commercial potential,” (ZEW 2009, p. 79, own translation).

Joint Technology Initiatives (JTIs) are a means to implement the Strategic Research Agendas (SRAs) of a limited number of European Technology Platforms. These few ETPs had achieved such an ambitious scale and scope that they required the mobilisation of high public and private investments as well as substantial research resources to implement important elements of their SRA. Based on these grounds, six ETPs have so far been identified to become JTIs (Innovative Medicines - IMI, Nanoelectronics - ENIAC, Embedded Intelligence Systems - ARTEMIS, Fuel Cells and Hydrogen - FCH, Aeronautics – Clean Sky, Global Monitoring for Environment and Security - GMES). The FCH for example is a means to implement the Strategic Energy Technology Plan (SET).²² JTIs are set up in the co-decision procedure as **public-private partnerships (PPPs)** following Article 187 TFEU (ex Article 171 TEC), five JTIs (except for GMES) have been established since 2007.²³

A first interim **evaluation** of the ARTEMIS and ENIAC JTIs by an expert panel concludes very positively about the overall concept (Bernotat et al. 2010, p. 7): “The Strategic Research Agendas that focus the activities of the JTIs have for the first time established a coherent view across industry, Member States and the European Commission of Europe’s priorities in these areas.” They recommend **continuation** of these EU-level activities, although some **achievements are still below expectations** such as the **mobilisation of national public funds**, project selection processes, coordination with respective Eureka clusters ITEA2 and CATRENE. Recommendations are particularly addressed towards member states, with priority on a multi-annual commitment of funds, and culminating in the strong general assessment that: “In particular, Member States should accept that each JTI should pursue a European strategic programme rather than an assemblage of national interests and should work together to support the JTIs in their implementation of their strategic programmes,” (p. 8).

Documentation of **German representation** in Governing Boards or **participation** and success in calls is not systematically available. Table 2 shows the publicly available information based on internet research. Engagement in governing or advisory bodies is being reported for three JTIs. Participation in projects seems to be very high as well, except for ARTEMIS, where Germans are only involved in half of the projects. Generally, coordinator roles for Germans seem to be rather rare in JTI projects (according to the limited information available).

²² European Commission’s strategic plan to accelerate the development and deployment of cost-effective low carbon technologies (2010), see http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm.

²³ Three more PPPs for green cars, energy-efficient buildings and factories of the future have been launched in 2009 as part of the European Recovery Plan, not being labeled as JTIs.

Table 2: German representation and participation in Joint Technology Initiatives (JTI)

Joint Technology Initiative	German Representation in Governing Bodies	German participation in projects of JTI calls
IMI (Medicine)	Particular engagement in States Representatives Group (SRG, advisory body) (<i>responsibility of Research Ministry, BMBF</i>).	Participants in 15 of 15 projects, 2 acting as coordinator.
ENIAC (Nanoelectronics)	Active role in Public Authorities Board (PAB) and Governing Board (GB) and in all PAB Working Groups (<i>responsibility of Research Ministry, BMBF</i>).	Participants in 14 of 18 projects, <i>coordinator roles not documented</i> .
ARTEMIS (Emb. Intell. Systems)		Participants in 9 of 19 projects, 1 acting as coordinator (<i>no data available for 6 more projects</i>).
FCH (Fuel Cells & Hydrogen)		Participants in 15 of 16 projects, 4 acting as coordinator.
CleanSky (Aeronautics)	Engagement in States Representatives Group (SRG, advisory body) and FP7 Programme Committee (<i>responsibility of Economics Ministry, BMWi</i>).	<i>n.a.</i>
Sources: BMBF (2010a) and BMBF (2010d) for representation; homepages of JTIs for project documentation.		

ETPs and JTIs are **considered to be promising approaches among German policy makers**. They are being mentioned as such in the *Bundesbericht Forschung und Innovation* (BMBF 2010a, p. 350). In the “Relaunch ERA”-Initiative of the German EU Presidency, it is acknowledged that they help to structure the ERA (BMBF 2007, p. 17). A more recent assessment after the first JTIs have started their work reflects some **problematic aspects**, such as undefined relationships with other instruments, e.g. between ENIAC and Eureka Cluster CATRENE. At the same time, member states have only limited influence on governance (often reduced to advisory activities in SRGs) and on project selection (BMBF 2010d).

3.2.2.2 ERA-Net and ERA-Net Plus

One of the most dramatic and successful institutional innovations in the last decade at the EU level was the establishment of the ERA-Net, ERA-Net Plus and the actual establishing of Article 185 TFEU (ex Article 169 TEC) initiatives. Through ERA-Nets a self-defined group of national (and regional) programme managers and owners with variable country representation (variable geometry) are co-funded by the Commission in order to establish learning and coordination among them. This coordination and cooperation can take very different forms, it reaches from simple learning and exchange of good practice to funding joint calls (again with variable joint funding mechanisms) and even the establishment of more durable joint structures, with few ERA-Net even establishing truly joint programme structures through so-called Art. 169 (now Art. 185) initiatives.²⁴ ERA-Net plus was introduced to support the implementation of a large joint call, incentivised by a top-up of that call through the Commission in areas of broad EU interest. Both the ERA-Net scheme and the ERA-Net

²⁴ For example the Art 185 contract iMERA in the area of Metrology (Edler et al. 2008) having led to the Art 169 (185) Programme EMPR <http://www.euramet.org/index.php?id=homepage>, a truly joint European Programme, cofounded by national and European funds. The German representative is the PTB, Berlin.

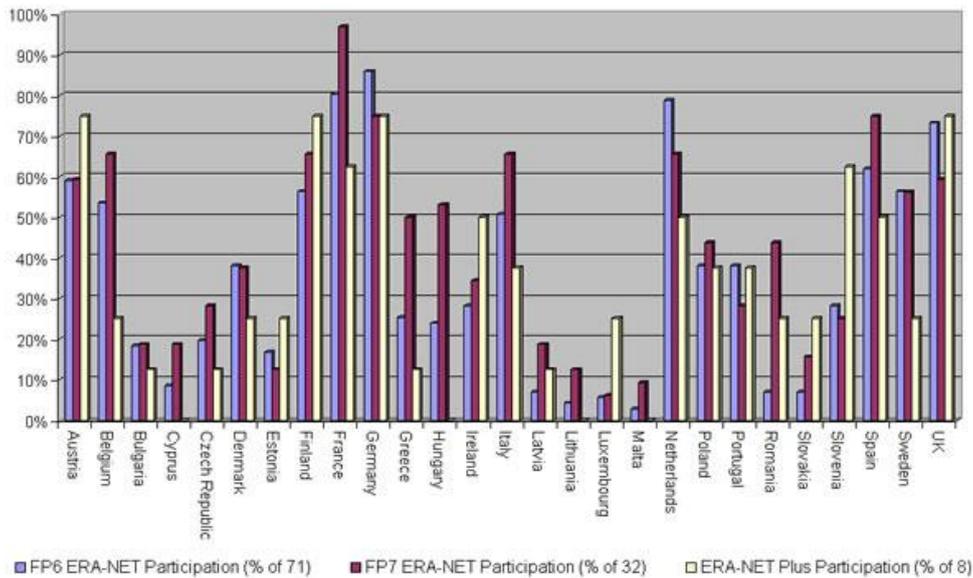
plus scheme have been assessed and by and large characterized as **highly successful** in mobilizing national /and regional) programmes to an entirely new level of joint action (Lock et al. 2009).

The success of ERA-Net (e.g. in terms of variety and speed of uptake, and range of activities to date), together with a good take up of ERA-Net Plus and strong attempts to select Article 169 candidates has signalled a seminal change with long term consequences we have not yet even begun to understand. There now is a strong bottom up movement to open up funding schemes, to increase transparency across European research funding mechanisms, and towards flexible joint actions. European funding agencies and ministries seemingly recognise the potential benefits of joining forces in order to design more responsive funding instruments and framework conditions conducive to flexible, more appropriate scientific cooperation schemes. This development means, broadly speaking, that Europe as a dimensions of coordination, joint action and joint strategy, is **“horizontalised” in national governments**, as all thematic areas in principle are open to this coordination, and the programme owners and managers are in the driving seat, not those policy makers and administrators mainly responsible for Europe.

In terms of overall **participation**, Germany has been, and still is, very active in the scheme, both in terms of participation, and in terms of coordination. As documented and referenced in the annex, Germany had and has between 100 and 116 participation in all ERA-Nets until 2009 (sources and counting modes differ). If one discounts for double counting of ERA-Nets (through renewal of contracts), Germany had 80 participations overall in networks and 20 co-ordinations (see annex). Overall, Germany contributed approx. 120 Million Euro to joint calls in those networks (19%). The range of organisations involved is very broad, multiple participation of five Federal Ministries, 7 Ministries of Federal States, 6 participations of DFG, and numerous of other implementation agencies (see annex). A comparative perspective, conducted 2 years ago, finds Germany to be most active out of all countries (in absolute terms), with most participations and most coordination roles. Due to the agency structure of Germany, and in difference to most other countries, Germany is represented by two actors, a ministry and the agency. Figure 4 and Figure 5 below show the relative importance of German participation. Germany had been most involved in FP 6 ERA-Net and ERA-Net plus, in FP 7 France is more involved and Spain has the same number of participation. As in FP projects, Germany has the highest number of coordinators across ERA-Net schemes and leads 3 out of 8 ERA-Net plus schemes.

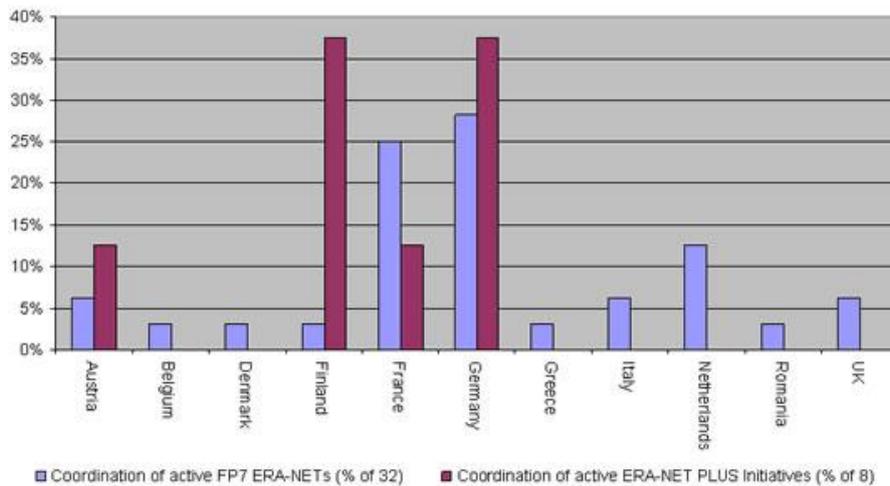
The participation process was entirely bottom up. The participation is thus highly diversified due to the agency structure in Germany and thus the European dimensions spreads across a whole range of organisations and also within large scale organisation. There is no formal coordination process in the ERA-NET process, and guidelines for participation by the BMBF were drafted at an advanced stage, but those were “guiding” rather than binding, which reflects the idea of spreading the benefit of engaging in joint activities on thematic and programme levels. However, due to a change of ERA-Net regulation in FP 7, ERA-Net can only be created in the areas of the thematic programme of the FP 7 which limits the bottom up nature to some extent.

Figure 4: Participation per country in ERANET and ERANET Plus schemes FP 6 and 7



Source: ERA-Netwatch <http://netwatch.jrc.ec.europa.eu/nw/index.cfm/static/mapping.html>

Figure 5 Coordinators per country in FP 7 ERA-Net and ERA-Net Plus



Source: ERA-Netwatch <http://netwatch.jrc.ec.europa.eu/nw/index.cfm/static/mapping.html>

For the participants participation was beneficial,²⁵ the main activities were common strategic thinking and action plan for joint action in future, benchmarking programme approaches and funding modalities, and as issued in the document. While most of the network contacts were not new as such, the joint action with those partners was. Interestingly, many ERA-NETS had a considerable impact, for almost all it enabled to fund new transnational collaborations in R&D²⁶ and

²⁵ As summarised in the ERA-Net evaluation, vol 2, German country report, Matrix/Ramboll 2009, vol 2, p. 17-18: Out of 32 participants answering a questionnaire within the ERA-Net evaluation, 58% said the benefit they expected materialised, 38% said it was more benefit than expected (Matrix/Ramboll 2009, vol 2, p. 19).

²⁶ Moreover, anecdotal evidence of ERA-Net case studies in the ongoing project CRIMASS (On the critical mass of public R&D programmes – A potential driver of joint programming) suggests that ERA-Net joint calls created

many adjusted national programmes and modalities (e.g. 50% starting adjusting evaluation criteria) new programme lines as a result of their participation) as well as content and time horizons.

The BMBF acknowledges the positive learning effects of the ERA-Nets which reach beyond the actual participation and enable better transnational activities in the future. **Potential problems** that are identified are confusing multiplicity of calls, the still persisting differences in modalities, and conflicts around efforts to both design and implement joint activities (BMBF 2007, p.7).

3.2.2.3 JOINT PROGRAMMING

The idea of setting up and implementing joint programmes of member states is already inherent to ETPs and ERA-Nets, however is subject to an individual initiative by the European Commission since 2008. The main rationale is to **address major societal challenges** by joint programmes, something which is assumed not necessarily to be achieved by other instruments which are driven by coordinating or joining up forces in certain technology sectors (ETPs) or in thematically/disciplinary defined research fields (ERA-Nets). Member states have agreed to launch such a process and the **first initiative** (JPI) on combating neurodegenerative diseases (Alzheimer's) is currently underway, while three more have been agreed upon in October 2010 (Agriculture, Food Security and Climate Change; Cultural Heritage and Global Change; Healthy Diet).²⁷

This agreement of the member states is accompanied, at least on the German side, by **scepticism** vis-à-vis the perceived Commission's attempt to centralise approaches and to potentially undermine existing bottom-up initiatives. While basically signalling agreement with the potential of Joint Programming to address major societal challenges, a German policy document clearly points out that for any implementation activities one should consider existing instruments, such as ERA-Net and ERA-Net Plus as well as the Strategic Research Agendas (SRA) by the Technology Platforms (ETP), and for particular instances Art. 169 (now Art. 185) initiatives, such as the EUROSTARS program or the JTIs and other PPPs set up according to Art. 171 (now Art. 187). It is also clearly underlined that Joint Programming should take place in the framework of the Open Method of Coordination (OMC), i.e. on a voluntary basis (BMBF 2009, p. 6). Currently, about 30 ERA-Nets are planning to implement Joint Programmes (MESR/BMBF 2010).

Meanwhile, Germany has joined the first JPI very actively and has recently proposed together with the French initiators a management structure for Joint Programming (MESR/BMBF 2010). Internally, coordination with respective ministries and agencies appears to be working, and moreover, the department for European and international relations at the Research Ministry has a flexible **budget to facilitate the participation** of these actors in Joint Programming (as well as other European activities).

complementarities to national calls, i.e. were able to attract R&D performing actors – mainly SME – which had not applied for public funding before.

²⁷ See for an overview of the process
http://ec.europa.eu/research/era/areas/programming/joint_programming_en.htm.

4 The innovation link – the growing significance of innovation at EU level

4.1 Innovation Union

The Innovation Union is the current end of a line of developments having started with the Lisbon Agenda in 2000. It mirrors the growing significance of innovation and innovation policy at the EU level and is a flagship initiative of the Lisbon Agenda's successor for the coming decade, the Europe 2020 strategy (European Commission 2010a). In line with the new normative turn innovation policies have taken everywhere, also the Innovation Union subscribes to a mission-orientation. European innovation policies shall address major societal challenges such as climate change, energy and resource scarcity, health, and demographic change. While certainly addressing major issues at stake, the communication does not clarify how the variety of instruments within ERA are to be mobilised which clearly address already the aspect of innovation. The main benefit of the European Research Area for example is being seen in bringing ideas to market, a reason for which the ERA should be "delivered" by 2014; however this does not include a reference to ERA instruments already in place, which could be vehicles for implementation, in particular current Joint Programming initiatives. Instead, the means of implementation of the European Innovation Partnerships remains vague so far. Further, it outlines as self-assessment tool for national and regional innovation systems to measure progress in implementing Europe 2020 goals.

The position of the Federal government, in this case drafted by the Economic Ministry and coordinated with the Research Ministry, is **in principle in line** with the approach of the Innovation Union. It is being recognised with some satisfaction that the German Hightech-Strategy (see below) fits well with the strategy laid out in the Innovation Union, such as improving framework conditions (access to finance, costly IPR, slow standardization and ineffective use of public procurement).

What is of **concern** to German policy makers is the governance approach taken by the European Commission, which is perceived as seeking to monopolise decisions on topics and budget at the Innovation Council (to be created as a new Council of Ministers' formation, while hitherto the Competitiveness Council has dealt with these issues). The Commission has moreover proposed an Innovation partnership called "Healthy Ageing", which is being perceived by the German national government as an attempt to undermine the similar Joint Programming initiative being currently coordinated among member states.²⁸ Therefore, the Federal government proposes to link the realization of innovation partnerships to existing ERA initiatives such as JTIs or the EIT (BMBF 2010b, p. 5, BMWi 2010, p. 3).

4.2 Community Innovation Programme

Chronologically, the CIP has to be mentioned before the Innovation Union, as it has been set up in 2007, following the Union's first innovation strategy of 2006. With the new innovation strategy "Innovation Union" CIP will also be redesigned in order to fit with the new premises. In the current

²⁸ See for a more moderate phrasing of these concerns the German position paper on the Innovation union, e.g. a hint on the example of the Hightech-Strategy for implementation, a reference to the principle of subsidiarity and the "complementary" nature of European level policies, and finally the wish to involve member states early on in all decisions with financial dimension (BMBF 2010).

period until 2013, it funds **mainly SMEs** with a budget of 3,621 million Euros. CIP comprises three programmes: a general innovation support programme (“The Entrepreneurship and Innovation Programme”), an ICT programme (“The Information Communication Technologies Policy Support Programme”) an energy programme (“The Intelligent Energy Europe Programme). Their overall goals are better access to finance, pilot project funding and networking. It has to be added, that the CIP does not provide direct financial support for SMEs. Instead, intermediaries grant the funding by way of loans or venture capital (in Germany e.g. by the KfW or AIF).

The **evaluation** of CIP (GHK/Technopolis 2010) concludes that the “...limited budget attached to CIP means that it is **not an expenditure-orientated programme** like the Cohesion Policy Funds or Seventh Framework Programme for Research and Technological Development; but one that seeks to achieve its ambitious and broadly defined objectives by **leveraging its ideas, products and partnerships into other policies and programmes,**” (p. 43). As for German **participation** in the programme, we have data for specific lines of action (cf. annex), according to which participation (or at least the requested EU contribution) is **lower** compared with other large member states, in particular Spain and Italy.

German policy makers regard parts of the CIP **positively**. Of particular use is the Europe Enterprise Network, where companies profit directly from information and networking. In addition, the financial instruments (venture capital) and eco-innovation are important measures. However, they **criticize** a great number of activities, for not reaching critical mass and enough added European value, and in particular, sectoral instruments, such as tourism for not meeting the objective of the CIP.²⁹ In the evaluation report, we find moreover, that at the national level, there are efforts to link and harmonise national and EU approaches in order to better profit from synergies. “However it is recognised that there needs to be more harmonisation. There is no mechanism in place for national representatives to understand both national and all EU priorities,” (GHK/Technopolis 2010, p. 86f.). For example, CIP does not appear as a topic in the national reporting on research and innovation (e.g. see BMBF 2010a).

4.3 Structural Funds and innovation and research

The Structural Fund Budgets for 2007 to 2013 have **massively increased budgets** earmarked for research and technology development RTD. All budgets within both funds (ERDF and ESF) related to research, innovation and entrepreneurship (“Unternehmertum”) amount to 7.55 billion EURO out of 26.3 billion EURO for 2007 to 2013 for Germany, and thus 29% (BMBF 2010a, p. 355). This means that large budgets from the ERDF are implemented at regional level within an overall national strategy framework plan (BMW_i 2009). Out of four funding priorities, the first focuses on support of innovation, research and development, knowledge based development and education. The regions are divided along their socio-economic into convergence and competitiveness regions, and measures within RTD are tailored accordingly (BMW_i 2009, p. 16).³⁰ Across the board of all regions, instruments and support measures within the first priority are widely in use (BMW_i 2009, Prognos

²⁹ Source: Interview partner from BMW_i.

³⁰ While BMW_i 2009 presents data and analysis for all German regions, a more detailed analysis for the competitiveness of regions has been performed by Prognos (2010).

2010). Table 3 below shows the allocation of the EFRE budgets that are earmarked for the priority 1, support for innovation, research and development, knowledge based development and education.³¹

Table 3: Allocation of EFRE in priority related to research and innovation

	EFRE Budgets 2007 – 2013 in mio EURO	% of all EFRE in OP*
RD&I		
Sum competitiveness regions	824	17.4
Sum convergence regions	1595	16.2
Sum Total	2418	16.6
networks and clusters		
Sum competitiveness regions	185	3.9
Sum convergence regions	165	1.7
Sum Total	350	2.4
innovation financing		
Sum competitiveness regions	314	7.7
Sum convergence regions	339	3.4
Sum Total	652	4.7
modernisation of HE infrastructure		
Sum competitiveness regions	189	7.8
Sum convergence regions	756	8.2
Sum Total	946	8.1
Modernisation of schools and formation infrastructure		
Sum competitiveness regions	135	4.0
Sum convergence regions	429	4.4
Sum Total	564	4.3
Sum Overall	4930	

Source: BMWi 2009, own compilation, does *not* include ESF

*indicates the % of all budgets within the Operational Programmes in German regions

The impact of these funds is obviously not to be assessed yet. However, the strategy report of the BMWi (2009) as well as the evaluation of Prognos (2010) – which focuses entirely on the competitiveness regions – both show the **breadth of instruments** that are implemented across all regions. For the competitiveness regions Prognos already concludes that the additional funds have been earmarked and implemented with great speed and delivers a set of **early impact** illustrations (Prognos 2010). The BMWi report, compiled by external experts, finds a well tailored mix of support measures that is complementary to and re-enforcing regional strategies. However, due mainly to the horizontal nature of many financing measures, it is not possible to define the allocation to specific thematic areas (BMWi 2009).

During its presidency, the BMBF obviously initiated a working group under the Council advisory body CREST (now ERAC) to define guidelines for improving the coordination of structural fund and framework programme when it comes to regional development. Those guidelines also ask national and regional policy makers to coordinate in the design and implementation of RD&I instruments. The BMBF together with the Federal State Brandenburg has conducted a good practice model as to how best integrate structural fund and framework initiatives (BMBF 2010a, p. 356). The BMBF

³¹ Further priorities in the ERDF as well as budget lines in the ESF finance activities and infrastructure that are relevant to research and innovation as well. This table, however, compiles all those activity lines that are directly linked to RD&I. For a full overview see BMWi 2009.

further has welcomed that the use of structural fund for research and innovation is likely to enforce the principle of “excellence only” in the framework programme (ibid).

All in all, the quantitative leverage and the linkage of measures and goals in the ERDF&ESF to national priorities as highlighted in BMWI 2009 and Prognos 2010 indicate a real shift of regional policy through support by the Funds, and it appears that Germany has **taken advantage** through the decentralised design and implementation of complementary policies and measures.

4.4 Lead Market and Public Procurement

The Lead Market Initiative (LMI) is a combination of policies, mainly public procurement, standards, other legislation and complementary actions. It was adopted on December 21st 2007 (European Commission 2007). Its major idea is to fill the gap in terms of **demand based policies** in Europe, to define a set of Lead Markets for which demand conditions, public procurement, standardisation and other legislation shall be improved in order to create a demand that is leading edge globally and then supports the competitiveness of European firms (who can sell innovative products) *and* the achievement of societal goals around the Lead Markets. The attempt has been of some success in pushing demand forward into the innovation policy agenda and also the discussion on public procurement. However, it was of limited visible success in actually creating impact on markets yet, as it was designed in limited areas with limited resources and mobilization. It was designed as a pilot rather than a full fledged Lead Market construction initiative and thus did not match the ambitions of the Grand Challenges debate and also ran the risk of flawed expectation management. Further, the involvement of Member States in the design was limited, and countries are represented unevenly in the first initiatives that are funded.

There is no mobilisation of German actors in the three pilot public procurement networks that are currently being financed. While the German government has its own public procurement agenda and has integrated public procurement considerations into the Hightech-Strategy, there are **no meaningful explicit linkages to the EU level** initiative. At this point this lack of involvement is not to be judged, the merit of the EU initiative is still to be seen. One can concede, however, that actors from the UK, France, Finland or the Netherlands are considerably more active here.³²

5 Government strategies towards ERA

This section discusses the strategies of the German Federal government towards the ERA. It reflects mainly most recent developments of the past two to three years, including the initiatives of the government during its EU presidency in the first half of 2007 and the relevant aspects of the German Hightech Strategy and internationalisation strategy for the ERA and innovation policy at EU level.

Generally, Germany takes a positive stance towards the ERA and the possibilities it offers for national researchers and institutions. It values the focus on major societal challenges, on excellence for research and innovation (competitiveness) and on the opening up of the ERA into the world (BMBF 2010e). However, at the same time, the Federal government insists on respecting national

³² See http://ec.europa.eu/enterprise/policies/innovation/policy/public-procurement/index_en.htm.

competences and the need to adapt European level policies to national conditions (BMBF 2009, p. 1; BMBF 2010e).

Naturally, German policy does not always share the main rationale of EU level intervention. They do not see fragmentation of research that prevents critical mass and excellence to apply across the board of issue areas. Rather, competition between nations is considered to be a main factor of competitiveness and excellence. German policy makers therefore perceive that they – like their counterparts in other big member states – are being perceived as ‘brakesmen’ of the ERA integration, while in their perception smaller member states naturally profit more from pooling resources and therefore are often in line with the approach taken by the European Commission.

5.1 German initiatives in Presidency

In the first half of 2007, the German Federal government held the presidency of the European Union. Its agenda for R&I policy is being referred to here shortly, as its main parts are still being pursued by the government in a sustainable and strategic manner. With four core proposals it attempted to relaunch the ERA (BMBF 2007). These were

- Support for basic research (at the ERC),
- Foundation of the European Institute of Technology,
- Development of an IP Charter for public research institutions and universities, and
- An increased use of structural funds for R&D.

We report here on a collection of evidence in order to tentatively assess whether the German government was successful with these proposals. We cannot do a real evaluation of success, as this would include to analyse how all relevant actors positioned themselves on the topics in order to learn how much support was already there and how much opposition to these proposal the German government faced.

The available information from documents (BMBF 2008a) and interview testimonies suggests the following (self-)assessment of German influence or success:

- There has been progress on the **ERC**, however it is not clear, whether this can be billed to German influence, moreover, as the German position on the ERC was internally contested in the beginning by the opposition of the DFG.
- The **definition of the EIT** and the KICs was finalized, mostly against the initial position of the Commission.
- Member state governments have agreed on the idea of the **IP Charter**. The German government has used its EUREKA presidency of 2009/2010 to push this topic further and has negotiated an agreement with Korea. The German government also chairs a CREST (now ERAC) working group on knowledge transfer, where this topic is also put high on the agenda.
- The use of **structural funds** for research and innovation has made progress. Germany had chaired a working group on that topic, too. They faced less opposition here, although they now perceive that the paradigm of excellence seems to be sustainably anchored also in the structural funds, which have before subscribed to regional coherence exclusively.

This agenda has tackled central aspects of the ERA realization, however clearly reflects also **the link to German interests**. In particular, the IP Charter is seen by the Federal government as highly relevant for German institutions, as the numerous outside-EU-cooperation need an improvement of IPR protection. Without the backing of the other member states, Germany's standing vis-à-vis partners such as Korea would not have been enough to secure an agreement. Secondly, the structural funds' turn in funding priorities promises to secure Germany further funding for years, which would not have been the case, had the regional coherence paradigm been maintained as the only funding priority.

5.2 Hightech-Strategy and ERA

The Federal government's Hightech-Strategy of 2006 is the first coherent national innovation strategy, meanwhile followed up by the Hightech-Strategy 2020 (BMBF 2010f). It links up to European level developments under the slogan of promoting the Hightech-Strategy in Europe ("Hightech-Strategie nach Europa tragen"). This means mainly that the identified societal challenges (climate, mobility, health, communication, security) need to be addressed at European (if not global) level. The slogan is not to be understood as a one-way route, it shall express the intention to contribute to a mutual fit of national and European approaches, which is realized by the reference to very similar societal challenges. Two existing ERA instruments are being mentioned as important in contributing to the strategy: (1) Joint Programming is regarded as an important means to address societal challenges; and, (2) Clusters are promoted as the most important tool for innovation policy, because of incorporating the idea of the knowledge triangle (education, research, innovation). This includes a reference to the first European top clusters realized in the KICs of the EIT with considerable German participation (including German top cluster competition winners). It is moreover one of the merits of the Hightech-Strategy to promote horizontal coordination among ministries, an important precondition also for successful European R&I policy.

5.3 The European Dimension within the Internationalisation Strategy of the BMBF

In February 2008 the German Cabinet for the first time adopted internationalisation strategy of the BMBF (BMBF 2008b). This strategy is a very explicit attempt to link national goals and priorities with international activities. The European dimension is a cornerstone in this strategy, with a twofold focus: First, to contribute to a European strategy on international, i.e. extra-European cooperation, and second to use the European dimension to foster international cooperation of German actors. One among several specific activities for this link is the involvement of the BMBF, through International Office, in the so-called Inco-Nets, networks between the EU and EU countries and countries from other regions of the world South-East Asia, Latin America, Eastern Europe / Central Asia, Africa, The Mediterranean region, and the Western Balkans³³. These networks play a catalytic role in fostering more cooperation in research with those regions, albeit the relative importance and outreach is still limited – as is the international dimension of the FP more generally (see above, also

³³ See <http://www.internationales-buero.de/en/2957.php>.

Edler 2008). More importantly, Germany has taken the lead on European level in terms of internationalisation of R&D and R&D funding coordination. It has led the CREST working group on “Internationalization of R&D – Facing the Challenges of Globalisation policies in R&I” and in doing so was instrumental in finalizing and presenting two CREST reports on internationalisation policies (see also CREST-SFIC 2010) and has played an active role in the European discourse to shape the internationalization agenda and bring it in line with German priorities (Matthes 2008). In addition, it has supported the setting up of a new Strategic Forum for International S&T Cooperation (SFIC) and holds the chair for the first two years of its operation (CREST-SFIC 2010). The first activity report of this Forum (CREST-SFIC 2010) and the interim report on the internationalization strategy (Bundesregierung 2009) indicate that the European and the German initiatives for internationalization are in line. In fact it appears that the explicit formulation of internationalisation goals and the role Europe plays in achieving those goals together with the active lead in key working groups and in drafting key reports at EU level are positive examples of how national policy can contribute to, influence and benefit from EU level initiatives. Compared to other large European countries, the German contribution to linking national and European activities as regards internationalisation activities has clearly been more visible and influential.³⁴

6 Governance processes and interaction

In this chapter, we give a brief overview of different aspects of governance within ERA from a German perspective. This includes more classical issues such as questions of the delimitation of competences between the different levels within the EU and different decision-making and coordination processes, but it covers also issues of governmental representation in different bodies and the involvement of important stakeholders in decision-making and coordination. The basic idea is to demonstrate the ways in which national and European policy-making are intertwined and how a more or less clear multi-layer structure has changed into a structure of mixed and coordinated governance between the various policy levels.

6.1 New rationales and modes of coordination in the EU multi-level structures

The Ljubljana process and the Lisbon Treaty have produced a new form of tension between the initiatives of the Commission and the Member States. Formerly, political processes were limited to instruments and budgets at the EU level. Through the coordination rationale of the Lisbon Treaty (research technology and are now defined as *shared* competences of the EU and the member states) and the trend to joint initiatives and funding, this has changed, initiatives of the Commission now potentially impinge upon national instruments based on how they are perceived to contribute to EU goals and principles. The current debate, outlined above, as to who has the initiative in joint programming is a case in point.

³⁴ This assessment rests not only on process tracing in documents and on analysis of participation in and lead of groups and reports, but also on accompanying observation of the process during a study for the BMBF on internationalisation (Edler 2007) and a subsequent study on internationalisation of R&D policies in Europe, through which the European wide discourse and developments could be traced (Boekholt et al 2009).

The qualification of the research policy area as a shared competence of the EU and the member states renders the application of the subsidiarity principle to EU level intervention in parts obsolete. There is the qualification that "*Union exercise of competence shall not result in Member States being prevented from exercising theirs*"³⁵ however, the Commission can launch any initiative it likes, and de facto uses this increase in competence.

The standard reference to the rationales for EU intervention found in the documents is the diagnosis of a defragmented research landscape and research policy across Europe, with different regional or national approaches not being individually capable of achieving "critical mass". Pooling of (human or financial) resources can be a valuable, if not necessary tool in order to strive for a more effective and more excellent research system (e.g. when addressing grand societal challenges or grand scientific or technological challenges, if they require large knowledge or data bases or infrastructures).³⁶ On the other hand, variety within Europe is not the same as the often negatively annotated "fragmentation", and positive aspects of variety in a multi-level system have to be considered. Rietschel et al (2009) make an important point as regard to the need for flexible approaches whereby trans-border cooperation should not be confined to the FP and cooperation and coordination should be fostered through creative, multi-based approaches:

"The FP should not develop into a substitute for the RTD policies of Member States or for other local problems, but should be better synchronised with national research efforts in order to strengthen and structure the ERA. It should also consciously avoid monopoly. At present, the Commission and the FP have a hand in almost all European RTD cooperation, risking a monotony of thinking and ideas and precluding the benefits of diversity of the European research system," (Rietschel et al. 2009, p. 60).

Decision-making procedures at EU level applying to R&I policies

The following list gives an overview on mechanisms and procedures applying to the research policy field and provides sources for further information.

- Ordinary legislative procedure and Special legislative procedures³⁷
- Open Method of coordination³⁸
- Art. 169, now 185, variable geometry³⁹
- Art. 171, now 187, PPPs⁴⁰
- Comitology⁴¹

³⁵ Art. 4 (3) of the Consolidated version of the Treaty on the Functioning of the European Union, Part One: Principles, Title 1: Categories and Areas of Union competence.

³⁶ Among further rationales for the EU intervention are improving framework conditions (access to finance, IPR issues, tariff and non-tariff barriers...) or offering flexible instruments for mutual learning and coordination of national (and regional) policies.

³⁷ See http://europa.eu/scadplus/constitution/procedures_en.htm.

³⁸ See http://ec.europa.eu/research/era/partnership/coordination/method_of_coordination_en.htm.

³⁹ See http://cordis.europa.eu/fp7/art185/home_en.html.

⁴⁰ See http://cordis.europa.eu/fp7/itis/faq_en.html#question8.

⁴¹ See http://europa.eu/scadplus/glossary/comitology_en.htm.

6.2 German Involvement at EU level and coordination with other Member States

German involvement at EU level

The evidence gathered and interviews conducted shows that Germany has played some role in shaping the agenda at EU level. On the basis of having observed EU level policy-making processes for more than 10 years and having conducted numerous studies on policy shaping in Europe, it appears that the German influence on EU level policies has grown. Indication for that are

- The active involvement in a range of committees, such as
 - the CREST⁴² group SFIC for internationalisation (chaired by Germany, as in the predecessor working group. This group has been initiated by Germany),
 - the initiation of the working group on knowledge transfer at CREST (now ERAC⁴³) during the German Presidency which led to the IP Charter (this group is also chaired by Germany), and
 - the ERAC Joint Programming group (with German member);
- Volunteering for the EUREKA presidency 2009/2010, which has been used to push the IP Charter further;
- The timely and – it seems – highly consensual position paper for the Framework Programme 8. The German government, despite its intensive and extensive coordination needs (see below), has issued its Position Paper to the Framework Programme 8 first within the group of large EU Member States;
- The Hightech-Strategy has influenced the Innovation Union debate considerable; and
- The EU unit in the Research Ministry (BMBF, Ref. 223)⁴⁴ has budget to facilitate EU level involvement, e.g. in Joint Programming, KICs. The Secretariat of EUREKA Pro-Factory could be moved to Germany on that basis.

To be sure, though, the German position does not play a strong role in all EU areas. For example, the innovation procurement debate at EU level was led without visible German involvement. All in all, however, the assessment of German involvement and initiative and thus the link to national strategies is positive.

Coordination with other Member States

Coordination activities with other Member states have not been systematically collected for this report. We are aware of some activities, such as the selective involvement in OMC cycles, ERA-Net and INCO-Net involvement and a most recent bilateral initiative with France on joint programming management. OMC, ERA-Net and INCO-Net involvement have improved the visibility of the EU dimension across the German government and increased peer pressure and learning as well.

⁴² Comité de la recherche scientifique et technique, see <http://www.consilium.europa.eu/showPage.aspx?id=1422&lang=en>.

⁴³ European Research Area Committee, see http://ec.europa.eu/research/era/partnership/process/crest_en.htm.

⁴⁴ Titelerläuterung, Einzelplan 30, BMBF.

6.3 National co-ordination

A further challenge is the enlarged need for coordination at national level. This is due to the horizontal nature of R&I policies, involving at minimum the German Research and Economics ministries. As sectoral R&I policies have become more important, and a strategic approach has been taken towards this policy area (Hightech-Strategy, Internationalisation strategy), the need for coordination has increased considerably and involves the e.g. the ministries for Health, Environment, Foreign affairs, Transport or Agriculture.

Further, as the structural funds are now much more potent in financing research and innovation initiatives the Länder have an even greater interest in shaping EU level agendas, and equally, they implement measures that are complementary to national policy and to Framework Programme measures.

Moreover, the large research organisations as well as the funding organisations have internationalised as well and have developed European strategies (Edler 2007). There is a growing awareness of the interconnectedness of political and institutional strategies with development at EU level across the stakeholders in Germany (see also the WR 2010).

There is a whole range of coordination committees:

- Europapolitischer Gesprächskreis (Research organisations, Business organisations, Länder),
- Thematic coordinators (of different ministries),
- Programme coordinators (different ministries, programme management agencies),
- GWK Working group Europe (coordination with the Länder).

Those committees appear to work, creating greater awareness of all actors involved (including those not previously concerned such as thematic programme management etc.). The “Bundesratsstellungnahme” to the FP 8 is in line with the BMBF position paper (BMBF 2010b), and no key German stakeholder has issued major criticism to the paper (except for a debate of applied versus basic research, but this has not harmed the overall impression of consensus), all want simplification of procedures and excellence instead of coherence. A further example of pro-active coordination is the joint support of ERC activities through DFG and the BMBF. Together, these developments have led to more involvement in those coordination committees and to an improvement in the overall discourse and strategic decision making.

7 Conclusion: The merit and challenges of ERA for Germany

In the last decade, and accelerated in the recent years, the European research policy and subsequently the innovation policy have undergone dramatic changes. A range of long-term ambitious initiatives have been developed, most notably within the path-breaking ERA process (research) and the Lisbon strategy (growth). The new instruments deviate from the classical cooperation funding by addressing either excellence (ERC, EIT) or coordination issues (ETP, ERA-Net). This report has introduced what ERA is and how the activities and instruments at European level have fundamentally changed and broadened. We have laid out how Germany takes advantage of the various initiatives, how the EU developments shape German strategies and priorities (and vice

versa), how German actors are involved at EU level and how the European dimension of R&I policy is being coordinated at national level. In this section, we are going to summarize and conclude with respect to the merit and challenges of ERA for Germany.

Merit and challenges of ERA developments

Our approach has not been, and could never provide, an overall assessment of EU level policies, however this report points to a number of conclusions on their **merit and challenges in general**:

- EU level policies and strategies in research and innovation policy are of crucial importance for the development of the research and innovation system in Europe, and their importance has increased (in terms of money allocated, in terms of the broadened focus on innovation, on grand societal challenges, excellence (ERC) and partly with respect to opening up to the world);
- The ERA delivers improved opportunity structures (instruments, more opportunities to join, to learn), whereby extra European collaboration still appears as a great gap. European instruments such as INCO-Nets and ERA-Nets are actively used to test and implement joint calls that are open for extra-European partners, but this needs still to be strengthened;
- The increased competences in the area of research policy granted to the European Commission by the Lisbon Treaty are suited to push the ERA forward, combining central and coordinated activities;
- However, those increased competencies and the intensity with which new initiatives are brought forward by the Commission bear the risk of supra-national centralisation even when coordination is intended and thus undermining the possibilities of bottom-up coordination in variable geometry schemes. The reference to the need for defragmentation of national approaches as the main rationale for EU intervention is not shared equally by all Member States and – as assessed for the Framework Programme – risks a “monotony of thinking and ideas and precluding the benefits of diversity of the European research system,” (Rietschel et al. 2009, p. 60);
- Further while the variety of new instruments and approaches to exploit new forms of cooperation and coordination across Europe is – in principle – fit for purpose, there is a danger of over-complexity. Many of the approaches are not yet fully shaped and equally, key approaches like the Innovation Partnerships and Joint Programming will necessitate a combination of existing approaches at national and European level that will be challenging. Equally, the bundling approaches with its “think big” rationale should not cut off existing bottom up approaches. If, for example, the ERA-Net scheme would only be supported in the future when it is linked to Joint Programming (what *some* officials in the Commission appear to aim at⁴⁵) then a successful policy innovation that mobilised new actors for coordinated action would be severely damaged;
- As postulated by any assessment of European instruments in the last decade or so, application and funding provisions yield a highly bureaucratic effort and thus pose a systematic entry barrier.

⁴⁵ This is based on anecdotal evidence gathered in the ERA-Net conference organised by the Commission in Brussels November 2011 and chaired by J. Edler.

Implications for national policy in general

The EU level developments have fundamental **implications for national policy** and policy-making. Before ERA, the policy of optimising participation in the framework programme, in order to secure a financial neutral return flow or even net benefit, could be regarded as sufficient. However, the ERA-developments as outlined above and the process of internationalisation and Europeanisation of research and research funding require more: National governments need a strategy, i.e. clearly defined goals and an approach on how to achieve them, e.g. in particular

- the creation of win-win situations for national and European actors, the combination of national and European goals and approaches;
- the mobilization of adequate representation at European level and shaping of increasingly complex multi-level concertation in Europe (with the European Commission and other member states), in particular as the Commission has increased competences due to the Ljubljana process and the Lisbon Treaty (2009);
- the coordination among national ministries and funding bodies (horizontalisation of R&I policy); and
- the mediation of interests articulated by stakeholders in particular within public research (in Germany mainly DFG, Universities, MPG, FhG, HGF, WGL).

Conclusions for Germany

Reflecting these European level developments and their implications for national policy and policy-making, our conclusions for Germany are **positive** in the following respects:

3. Overall, the participation in European instruments results in **net benefits** for Germany. For the Framework Programme (and also for other instruments) financial benefit is neutral compared to Germany's EC contribution. However, on top of this, evaluations for several instruments find evidence for socio-economic, scientific and technological effects. Moreover,
 - The thematic fit of the Framework Programme with German national programmes seems appropriate;
 - Financing R&D through structural funds is a big change and seems to work fine in Germany. Germany profits from introducing Lisbon priorities into structural funds.
4. Perhaps the most important benefit for Germany remains the improved opportunity structures for national researchers as a **catalyst for international collaboration** (with actors inside and outside of Europe). Participation is therefore not a hobby horse or simply a matter of "money back", but of important national interest. More particular, German participation and representation in most of the new instruments is leading in Europe (ERA-Nets, EIT, and partly for ERC and ETPs).
5. While there is no explicit strategy towards ERA, Germany has developed in the last years a **strategic thinking and action** towards the ERA.
 - There is a strong **involvement** of national policy makers into European issues, a clear improvement to earlier years: German actors and policy makers have been a proactive part of the ERA development. Representation in EU level bodies (e.g. ERAC working groups, EIT governing board, ERA-Net coordination) is numerous. In particular the EU presidency has been used effectively;

- EU level instruments are being used for national goals (joint challenges, IP Charter, researchers mobility and many more);
 - The official internationalisation strategy pays great attention to European level developments. The German government aims at exporting the principles of the internationalisation strategy to the European level, i.e. to work for an opening up of the ERA to the world along the lines of the internationalization strategy;
 - Further, there are attempts to influence the European level innovation policy with principle ideas of the Hightech-Strategy. There appear positive synergies between Lisbon strategy coordination requirements (national, but these are asked for through the Lisbon process), Hightech-Strategy coordination (national) and new EU approach of Innovation Europe.
6. Triggered by a broadening of R&D policy and innovation policy at EU level, there have been steps towards a more functional “**horizontalisation**” at national level, i.e. European involvement is becoming part of the strategic thinking (e.g. Hightech- and Internationalisation strategy), and there is a stronger awareness of European issues across all ministries (e.g. visible in ERA-Net participations). Moreover, there is now also an example of more coherent representation of a larger group of German actors at EU level: research organizations and other stakeholders agreed to communicate the official position for FP8.

However, there remain several **challenges** when it comes to maximise the benefits of the ERA development for Germany and contribute to an optimised ERA development. Not all of the them can be addressed by the German Federal government exclusively, however, it can take a leading or supporting role, as the following summary shows (see also the set of recommendations targeted to different actors in the WR report, WR 2010, p. 140ff.):

1. There is the issue of **overall governance**, a tension appears to arise between strong centralised initiatives and implementation (potential “magnetism” of the Commission) on the one hand and variation, bottom up-initiatives and competition among member states on the other hand. Member states will need to continue their productive discussion with the Commission about rationales for EU intervention and indicator development for monitoring the ERA progress. For Germany (like for all governments) it is important to stay in the game, i.e. to secure a **continuous** representation of the national government in different working groups and bodies.
2. Similarly, while a variety of instruments can be positive in allowing flexible and innovative approaches, the danger of an over-complex and unwieldy instrument landscape can only be addressed by joining forces among member states to promote a) the **systematic evaluation**, which necessarily includes an impact assessment of the SF for research and innovation, and b) the **consolidation** of the instrument landscape and to reduce overlaps (e.g. re-assess the overlap of EUREKA clusters and umbrellas with JTP and ETP, and also KICs of EIT or the above described overlaps of joint programming instruments). Germany should (continue to) take a leading role in prioritising these issues on the agenda.
3. Also, the gap in the instrument landscape with respect to **extra EU cooperation** needs to be actively addressed. Germany should continue its efforts to **promote its internationalisation strategy** in the respective ERAC working group.
4. High bureaucratic hurdles of application procedures could be remedied at European and national level likewise. As the instruments are quite different, promoting a unique

application procedure for all instruments is not the adequate answer. Thus the issue of **efficiency and simplification of procedures** should be kept high on the agenda (as is done currently in preparation for FP8, also by the German Federal government). At the national level (in Germany), more specific analysis is needed in order to **find out which groups are structurally at a disadvantage** of application procedures and to subsequently target special support for EU applications to them.

5. The most recent ERC participation statistics underline again that German host institutions are less attractive to international researchers. Universities and research organisations have to do their homework here, but the Federal government and the Länder governments have to make sure that **framework conditions for career, working and living** such as contracting, payment, social security and similar offer flexibility to the needs of international researchers.⁴⁶
6. The current developments at EU level in fact drive in the direction of more opening up of national programmes. Joint activity in ERA-Net are just one possibility of joint action and coordination, a more comprehensive opening up of funding programmes of funding organisations and ministerial programmes would be a natural next steps. To be an active part in these developments, as it appears to be the case, is in the full national interest.

The development towards a – better – ERA, ill-defined and amorphous as ERA as a concept and as a vision may still be, is essential if Europe wants to exploit its potential and be a strong global player in the 21st century. The role of Member States in this development is ambiguous: supporting coordination, variable geometry, links of research, innovation and education policy instrument and, intelligent integration into truly European approaches – all of this can play to the advantage of Europe and Member States alike. However, every journey continues with the next concrete step. Sharing overall principles is one thing, agreeing on concrete priorities and instruments quite another. The negotiations for FP 8 that are underway mark a next step in the European journey. It is in Germany's interest to support and to influence this agenda. The early launch of the position paper for FP8 and the explicit link of national initiatives to European ones are positive signals.

The further developments of ERA as discussed match with the German research and innovation system and the respective policy rationales. Three final examples may illustrate this. First, the development towards a challenge based concept for FP 8 matches developments in the German research support system. The challenge will not only be to strive for an intelligent combination of national and European priorities, but to keep the European FP 8 funding approach open to broad collaboration, i.e. to define the missions not too narrowly. Second, the broader coordination approaches within the Innovation Union are in line with collaboration and networking approaches well established in German programmes at national and regional levels. The challenge will be to streamline instruments and avoid mushrooming of un-coordinated approaches. Third, the strong involvement in ERA-Nets and other coordination approaches (JTIs, TPs etc.) mark a broad stakeholder support in the funding and research system for coordinated approaches. The challenge here will be further support this engagement in a way that creates win-win situations, overall

⁴⁶ This has already been outlined in the 2009 EFI report.

efficiency gains on the one hand and clear contribution to the individual goals of those engaging in coordination on the other hand.

The old times of clear division of labour between what is European and what is national in research and innovation policy are gone for good. There is no alternative for German policy to the capturing of the opportunities that lie in a more coordinated European Research Area, especially as it turns into a Research and Innovation Area. The continuous challenge will be to work towards the right balance and synergies between national, internationally coordinated and supranational policies and instruments. To do so, policy makers, administrations and other stakeholders across Germany need to continue constructive dialogue and engagement as well as improve monitoring, analysis and reflection for decision making in an increasingly complex world.

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Annex

Experts interviewed for this report

We have interviewed two central actors in the Research Ministry (BMBF) and Economics Ministry (BMW) in order to validate our results from the document research.

- BMBF, Ref. 223 (ERA)
- BMW, Ref. VII A 1 (Grundsatzfragen T&I Politik)

ERA-Net Statistics

Table 4: Germany's role in the ERA-Net scheme

Participation FP 6	61 of 71 (86%) ⁴⁷
FP6 ERA-NETs with German coordinator	15 ⁴⁸
FP6 Funding from the ERA-NET scheme to German participants:	€26.9m of €190m (14.1%) ⁴⁹
Participation total (FP 6 and FP 7) ⁵⁰ :	116 of 136 (86 when excluding doubles) ⁵¹
German coordinators total ⁵² (excl. doubles) ⁵³ :	20
German participation in <i>currently active</i> ERA-NETs:	61 of 76 ⁵⁴
Joint calls with German participation:	51 or 68 ⁵⁵
German financial contribution to joint calls:	€ 119.9m of € 640.0m (18.7%) ⁵⁶
Average German contribution to joint calls:	€2.35m ⁵⁷

Source: NETWATCH website, <http://netwatch.jrc.ec.europa.eu/nw/index.cfm/info/Country/CountryCode/DE>, see also various footnotes

⁴⁷ There are different numbers in different parts of the FP6 ERA-NET Study report (Matrix/Ramboll 2009): 1) vol. 1, table 38 (p. 179): 60 ERA-NETs, 2) vol. 2, (Germany country case) p. 94: 61 ERA-NETs. , through triangulation with other sources we rely on the second source.

⁴⁸ From Netwatch, counted from list, see Annex III) (NB: MARTEC is an FP6 ERA-NET although not listed as such in the database). Confirmed by my own numbers:
http://netwatch.jrc.ec.europa.eu/nw/index.cfm/static/mapping_2009.html.

⁴⁹ Ibid

⁵⁰ Based on the JCR NETWATCH page. Incl. FP6, FP7, ERA-NETs 'under preparation' as well as at least one self-funded ERA-NET (ERA Chemistry). It seems that only some ERA-NET+ and Art. 185 are there. In general, the best up-to-date sources but possibly not complete.

⁵¹ There are 30 'doubles' (9 with a German coordinator), that is ERA-NETs that have continued from FP6 to FP7, from normal ERA-NET to ERA-NET+, and in one case art. 185.

⁵² This excludes one German-based organisation classed as 'international': EURAMET e.V., a dedicated legal entity for iMERA+

⁵³ There are 30 'doubles' (9 with a German coordinator), that is ERA-NETs that have continued from FP6 to FP7, from normal ERA-NET to ERA-NET+, and in one case art. 185.

⁵⁴ Based on status in the NETWATCH database, which may not be accurate.

⁵⁵ Different numbers in different parts of the FP6 ERA-NET Study report (Matrix/Ramboll 2009): According to Vol. 1, table 23, p. 153 there are 51 calls with German participation, According to Vol. 2 (country cases), there are 68 calls with German participation (both have the exact same total budget ~ €120m)

⁵⁶ Ibid. This is taken from table 23 (annex I here) that specifies country participation. According to tables 19, 20 and 21, the total amount invested in joint calls was €773,810,749, of which €663,465,513 public funding. The difference of 130m is due to the fact that not all contributions could be allocated to a country source by the reviewers (see note 165 on p. 151).

⁵⁷ Ibid. Based on 51 calls. See table 23 in annex II. If based on 68 calls, this would be €1.76m. In the previous (early) overview based on 45 calls, this number was approx. €3.3m. See http://netwatch.jrc.ec.europa.eu/nw/index.cfm/static/mapping_2009.html.

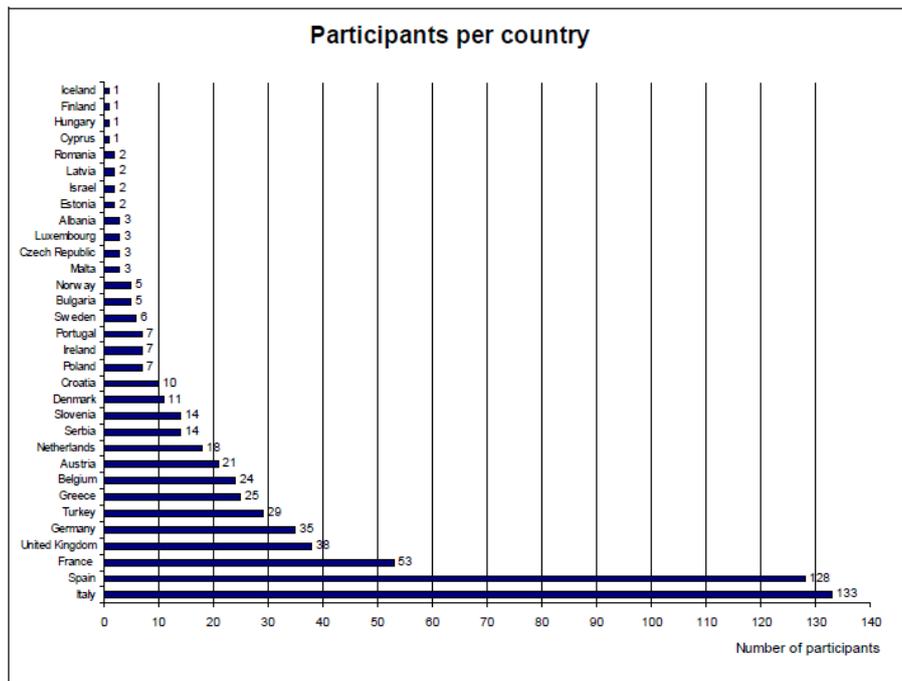
Table 5: German Participants in ERANET

Organisation	Type	Participations	Total Budget (EUR)
BMBF	Ministry	20	752,349
BMVBW	Ministry	1	253,940
BMVEL	Ministry	5	730,428
BMWI	Ministry	8	246,564
BMAS	Ministry	1	0
Ministries at Land level	Ministry	7	118,720
DFG	Funding / programme management agency	6	1,951,342
PTJ	Funding / programme management agency	16	7,763,763
FZK (PT)	Funding / programme management agency	5	990,449
MVBW (TÜV)	Funding / programme management agency	3	2,394,403
PT-DLR	Funding / programme management agency	11	4,323,246
PT VDI (TZ and IT)	Funding / programme management agency	5	1,808,882
PT-Various	Funding / programme management agency	5	1,679,476
Others	-	17	3,850,635
Total	-	110	26,864,197

Source: Matrix/Ramboll 2009, German country study p. 7

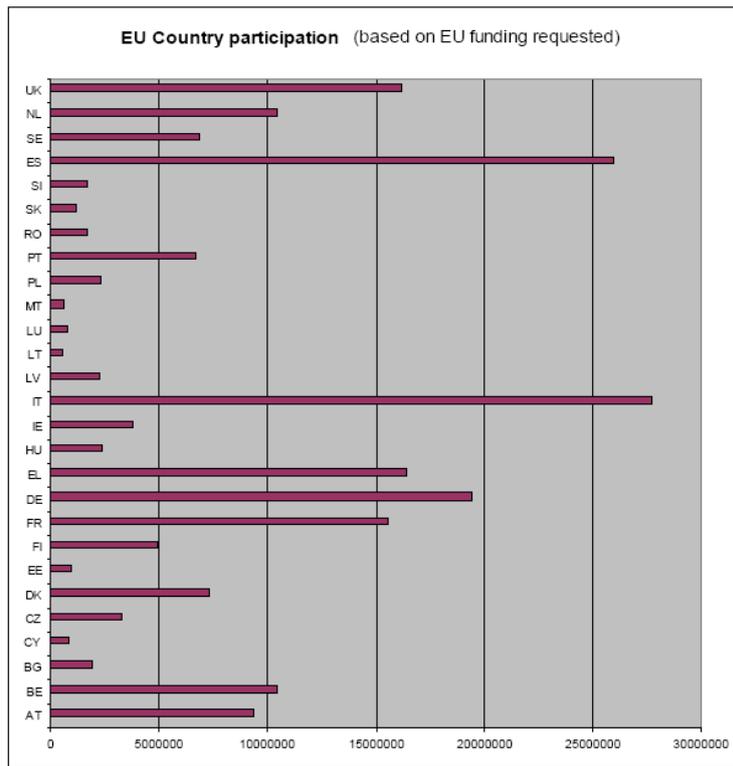
CIP Statistics

Figure 6: Participants per country in 2009 CIP eco-innovation call



Source: European Commission (2010b), p. 11

Figure 7: Participation in CIP ICT PSP Call (2007-2009)



Source: European Commission (2010b), p 19.