

Towards new collaboration cultures? The achievement of European and international research programmes so far and first experiences with the implementation of the 6th Framework Programme ; Semmering report deliverable 3

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SEMMERING

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DELIVERABLE 3

'TOWARDS NEW COLLABORATION CULTURES?'

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Vienna, August 2004



‘Towards New Collaboration Cultures?’

Deliverable 3 of the SEMMERING Accompanying Measure Contract No. HPSE-CT-2001-60026

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Towards New Collaboration Cultures?

The Achievement of European and International Research Programmes
so Far and First Experiences with the Implementation of the 6th Frame-
work Programme

SEMMERING Report Deliverable 3

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Towards New Collaboration Cultures?

The Achievement of European and International Research Programmes so Far and First Experiences with the Implementation of the 6th Framework Programme

1. Introduction

This report, the third to come out of the Accompanying Measure “Shaping the European Research Area. Science Policies for an Enlarged Europe” (SEMMERING: HPSE-CT-2001-60026) is based on research work presented and the ensuing debates held at the 8th SEMMERING Forum, which took place in Brussels from November 10 – 12, 2003, as well as ongoing research within and around the network. The third conference dealt with the effectiveness and efficiency of international and national research programmes to stimulate cooperation among scientific organizations and researchers on the one hand, and between researchers and stakeholders on the other. Cooperation between science, research, society, economy and politics requires mutual influence and, accordingly, collaboration; however, the autonomy of science and research is a prerequisite for innovation and research creativity. Thus, collaboration between knowledge providers and stakeholders becomes a quite complex issue.

A related issue also addressed by the third SEMMERING conference is the incongruence between the long-term orientation of science and research, on the one hand, and the short-term needs of potential users, on the other. An increasing part of scientific work is carried out by specific user-provider networks, which operate within a long-term framework, but based on procedures that can deliver short-term recommendations. Relevant to this are the shifting boundaries between universities, research organizations, consultants and networks comprising users, researchers and mediators.

The conference dealt with the following three topics in three separate sessions:

1. The role of the new Member States in the European Research Area
2. Including stakeholders: Towards knowledge-based societies and democratic governance?
3. Use and dissemination of knowledge: What do the users expect, what can researchers deliver?

In addition, three round tables were organised as panel sessions, bringing eminent researchers together with policy makers from national and European institutions:

1. The European research area and the Framework Programmes: Mobilising the creative forces or creating new ivory tower?

2. Universities, research centres and foundations in the European research area
3. Towards new collaboration cultures?

This report builds primarily on the material presented at the 8th Semmering Forum in Brussels (November 2003). Most of the material is directly taken from the presentations held and papers presented at the conference. The conference was part of the SEMMERING series of conferences and workshops organised by the Interdisciplinary Centre for Comparative Research in the Social Sciences (ICCR) jointly with the European Association's (EA) S&T Research Group since 1993. For a more comprehensive presentation of results, the sessions and roundtables are clustered together. Research results presented in the first session have been combined with those of roundtable 3, while topics discussed in sessions 2 and 3 (on the inclusion of stakeholders on the one hand and the use and dissemination of knowledge, on the other) have been grouped with roundtable 2 (universities, research centres and foundations in the European Research Area). Finally, roundtable 1 on the European Research Area and the Framework Programmes constitutes the last category¹.

2. The Role of the 'Old' and 'New' Member States in the European Research Area – Towards New Collaboration Cultures?

The chapter on science and research in the EU candidate states was quickly concluded and considered easily compatible with the established *acquis communautaire*. The field of science and research did not pose any major obstacles to the accession negotiations, though the *acquis* only refers to the legal framework of the European Union and not to fundamental issues such as research infrastructures or the competitiveness of research institutes in the new Member States. Now that it has all been 'said and done', the role of the new Member States in the European Research Area and the opportunities available, but also the difficulties they may face, must be assessed. To date, European research policies have demonstrated only partial and fragmented forms of collaboration between Member States. The concept of the European Research Area calls for new collaboration cultures at different levels and the coordination of national science policies.

2.1. Reflections on Knowledge Economies and the European Research Area

The process of European enlargement has accentuated the difficulties of less developed regions to 'keep up' with the pace of highly developed regions in all respects, i.e. also in the establishment of 'knowledge economies'. According to Riccardo Cappellin (*International Knowledge and Innovation Networks for European Integration, Cohesion and Enlargement*), extending knowledge and innovation networks at the inter-regional

¹ The results of some of the papers that were presented during a specific session or roundtable have also been 'shifted' to coincide with the categories discussed in this report, e.g., the contents of a paper presented in session 1 has been 'shifted' to roundtable 1, etc.

and European level will contribute to increased productivity and growth in less developed regions in the new, as well as the old Member States. Knowledge is channelled by formal and informal institutions within *networks* (Kogut et al., 1993; Keeble and Wilkinson, 1999; Amin and Cohendet, 1999; Gordon, 1991). Networks consist of a “series of direct and indirect ties from one actor to a collection of others, whether the central actor is an individual person or an aggregation of individuals (e.g., a formal organization)” (Davern, 1997). The ‘social ties’ connecting the various actors represent the relations between the individual actors. Close collaboration and trust are essential components in the relations (or social ties) between the actors, thus promoting innovation and learning on the one hand, and preventing market failures by spreading risk, on the other (Granovetter, 1985; Piore and Sabel, 1984). In other words, networks consisting of solid and informal social ties between actors enhance economic growth and advance knowledge.

While knowledge and ‘learning’ (i.e. intended or unintended processing of experiences) can provide numerous opportunities for growth, it can also lead to exclusion and marginalization of less developed regions. It is therefore crucial to provide access for less developed regions not only to codified knowledge² and RTD networks, but to tacit knowledge³ and concrete know-how as well. The creation of ‘new’ knowledge involves an intense process of interaction (Knack and Keefer, 1997; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998; Nonaka et al., 2000; Ritzén et al., 2000; Spender, 2001; Steven, 1998) which is characterized by the transformation of tacit into codified knowledge. The transfer of tacit knowledge which is often more significant than widely and routinely available codified knowledge, usually requires face-to-face contact (i.e. physical proximity), as it cannot simply be traded on markets. How crucial spatial proximity is for the sustainability of learning and innovation networks and how it can be made compatible with the need for connectivity to intensify European integration and cohesion and bridge the gap between high and less developed European economies, represent key theoretical and policy questions.

According to New Growth economics a country's capacity to take advantage of the knowledge economy depends on how quickly it can transform into a ‘learning economy’. Here learning refers not only to using new technologies to access global knowledge, it also means using these to communicate with others about innovation. In the ‘learning economy’ individuals, enterprises, and countries will be able to create wealth in proportion to their capacity to learn and share innovation (Foray and Lundvall, 1996; Lundvall and Johnson, 1994). Thus, for economically weak regions to establish ‘knowledge economies’ successfully, new ‘hard’ and ‘soft’ infrastructures and institutions will need to be created at the local and European levels. Through these infrastructures and institutions, knowledge and innovation networks operating in highly de-

² ‘Codified knowledge’ is easily transferable in information and can be transmitted through information technologies and infrastructures over long distances and across organizational boundaries.

³ ‘Tacit knowledge’ (Polanyi, 1958) is “subconsciously understood and applied, difficult to articulate, developed from direct experience and action, and usually shared through highly interactive conversation, story-telling and shared experience”. (Zack, 1998).

veloped regions across the EU, can spill-over to less developed regions in southern Europe and the new Member States in Central and Eastern Europe.

To facilitate and enhance the 'spill-over' of knowledge and innovation networks, the concept of the European Research Area ought to be broadened to include the role of various actors apart from research institutes and universities to include actors involved in regional and national innovation systems and in multi-level governance structures such as industry, service sector, intermediate and public institutions. The production of scientific knowledge is no longer the exclusive domain of universities and research organizations – the number of actors and institutes actively involved in the generation of knowledge is rapidly multiplying. As a result, a local production and innovation system incorporates a plurality of actors such as large and small enterprises that are members in networks, private RTD laboratories, consultancies, associations of enterprises, organizations of professional training, etc. (Patel & Pavitt, 1994; Freeman, 1995; Cooke, 1998). This must be taken into account when conceptualising the European Research Area.

To summarize, five dimensions of European economic integration and cohesion must be considered when reflecting on the development of a European Research Area :

1. the economic and/or technological gap between various European areas and regions;
2. the role of the local knowledge absorption capacity and the level of innovation capabilities, which leads to greater flexibility and internal diversification;
3. the challenges and opportunities created by conflicts or collaboration between internal and external actors, with special reference to production and technological integration;
4. the role of obstacles and 'hard' or 'soft' infrastructures which hinder/facilitate the interactions within and between the various regional and national knowledge systems;
5. the role of Community policies aiming to foster European integration, with special reference to RTD and regional policies.

Cappellin's recommendation for future research is to enhance already existing indicators schemes such as the European Innovation Scoreboard by including new indicators derived from the model of Territorial Knowledge Management, and to carry out extensive empirical analysis on factors playing a role in knowledge and innovation processes, which can contribute to the improvement of the European Innovation Scoreboard. Instead of focusing on the levels of certain immaterial resources, empirical analysis of the European region's knowledge and innovation potential should concentrate on the 'levers' of the process of knowledge creation and on knowledge flows characterizing knowledge and innovation networks at the regional and inter-regional/international level. The analysis of knowledge and innovation networks should furthermore take different geographical levels and spatial typologies such as metropolitan regions, developed industrial regions, industrial re-conversion regions, 'eco-

nomically lagging' regions (Objective 1 regions), transition economies in the new Member States, etc. into account and investigate the divergences and forms of interaction between these different areas.

In order to assess the impact of various policy 'levers' on the different dimensions of the knowledge creation and innovation process, the most significant policy instruments adopted in the regions in question should be identified and the gap between the demand and needs, as well as the supply of innovation policies evaluated. Consequently, the capability to explicitly respond to the specific needs of individual regional innovation systems can be determined and responded to.

2.2. Collaboration Cultures

Though Europe has a long tradition of collaboration in higher education and research rooted in medieval universities such as Bologna, Paris and Oxford, an overall 'collaboration culture' between the EU and the new Member States in the context of research is missing or relatively weak. Several cooperation networks and programmes opened to researchers from Central and Eastern Europe following the collapse of the Soviet Union, including COST; EUREKA, INTAS, etc., which provided additional resources for the internationalisation and development of research in the CEEC.

According to Guenter H. Walter (*European Tradition – A New Basis for Collaboration Cultures in European RTD With the New Member States in Central and Eastern Europe?*), cooperation between European research institutions often tend to be based on very individual interests and specific endeavours such as:

- Exchange of research material and know-how that are not available within the institution or country;
- A division of labour between theory oriented basic research – which continues to be very strong in Central and Eastern Europe – and more applied research on experimental development in the EU;
- Exchange of complementary technologies from different research fields, such as conventional technologies on the one hand, and high tech on the other;
- Advantages of mixed project calculation between partners from countries with relatively low personnel costs and partners with high personnel costs, in order to realize joint projects in international competition, and
- Because international cooperation creates possibilities of raising money from various funds (e.g., the European Commission).

For a new collaboration culture and a genuine European Research Area to evolve, intensive exchange of personnel must take place, close relations between the various organizations (science, economy and policy) built, a common system of references formed, a single European dimension for scientific careers created and EU RTD support for improved coordination of research activities regrouped. Furthermore, RTD

policies would have to be converged both at national and EU levels, and the day-to-day legal barriers and other impediments removed.

A number of problems exist that must be dealt with before a stable and viable research area can exist in Europe and before the linkages and networks between the relevant actors are fully established. During the transitional period, a significant shift in the nature of the linkages between firms and the research base took place in the CEECs. These institutional changes negatively affected knowledge transfer, as in the case of Bulgaria, resulting in the country's position with regard to the technology transfer index (in accordance with the Global Competitiveness Report) being particularly low. According to Rossitsa Chobanova (*Innovation Interfaces and Support Measures*), the level of activities of the business networks for innovation in Bulgaria remain insufficient and the cooperation and coordination between the research community and industry continue to be weak. Nonetheless, some networks for inter-business cooperation exist in Bulgaria, the intensity and efficacy of their interaction depending on the intensity of demand for their output. As demand is currently low, the networks' performance and output is also nominal.

If the European Research Area is regarded as a 'common market' for research and innovation, its basic features should include the existence of research goods and services, competition and customer demand. If Bulgaria (and other future or present Member States for that matter) aims to enter and endure in this common market as a producer of research and innovation, it must measure itself with the already existing market players to identify the market niche appropriate for it and develop the capacity for effective integration to the structures and mechanisms unifying their market with respect to the other markets. As Christo Balarev and Mirolyuba Madjarova (*The Newcomer Bulgaria and the Integration into ERA*) point out, these processes are very complex and are determined by a multitude of concomitant regulations and phenomena applying to all participants in the European Research Area. To overcome the problems, collaboration between science, research, society, economy and politics ought to represent a mutual process of influence at national and international level. For small open economies like the Bulgarian one, collaboration with the EU is clearly a major factor for modern innovation networks to develop and prosper.

2.3. Beyond EU Member and Candidate States

In his paper *European Research Area and the Post-Soviet States: Searching for New Partnership*, Igor Egorov draws attention to the fact that the idea of a common European Research Area is not limited to the EU Member States and candidate countries only. A broader perception of the concept of a European Research Area opens the door for the involvement of non-EU researchers in research projects (among others the Framework Programmes) with their counterparts in current and future EU Member States. Cooperation in S&T between the EU and post-Soviet states could provide substantial benefits to all participants alike, in particular for those countries intending on joining the European Union in the future. Through S&T cooperation, these countries will gather important resources (including organizational know-how) for supporting and modernizing their research systems and thus coming one step closer to adapt-

ing to the standards already achieved in the Member States. A significant part of the R&D expenses in some of these countries are related to joint research projects with partners from the EU. EU enlargement will strengthen this tendency, considering that a number of research institutes in the new Member States have established contacts with corresponding scientific organizations in the former Soviet Union.

EU Member States would also gain important dividends in the scientific sphere from such cooperation with post-Soviet states. Knowledge exchange will enhance European positions in critical areas, such as space, nuclear physics, etc. This will help 'fill the gaps' that exist in the European research system. Purely economic benefits are difficult to assess, on the other hand, but they also could be substantial. Furthermore, contacts between specialists and experts will contribute to a better mutual understanding between the nations in the different parts of Europe. The impact of the scientific programmes on the development and position of new elites in the post-Soviet countries (in particular exchange programmes) will also be difficult to assess⁴. Nonetheless, post-Soviet countries could partially compensate the lack of specialists in certain areas in the EU and would get a number of benefits in return. The obstacles include the lack of financial resources in the post-Soviet states, degradation of substantial parts of S&T systems in these countries, cultural and political barriers and underdevelopment of Eastern European S&T policy. Means and instruments to tackle these negative factors must be considered to make cooperation between EU Member States and post-Soviet countries more effective.

3. Inclusion of Stakeholders and the Use of Knowledge

The European Commission's Communication on European Governance asserts an increased interest in involving stakeholders in policy-making, as well as in the setting of science and research agendas. The concept and definition of 'stakeholders' is rather broad and includes interested citizens, their representatives, NGOs, industrial representatives and political elites. The Lisbon strategy clearly aims at mobilizing the full potential of science and research and is particularly concerned with private investment in R&D and public-private partnerships in this field. Even though this approach could be said to favour applied research and competitiveness, it might contrast with the claim of independence of science and research. An important issue in this respect is that of property rights, as public money is – at least in part – invested in research, yet the access to the results might be restricted. Another crucial issue is the distributional effect among European regions: "innovative regions" might gain a leading edge, less favoured regions might fall behind even more.

At the SEMMERING conference, an array of papers was presented, each addressing different types of stakeholders and users. Franz Pichler (*Between Lobbying and Religious Fundamentalism: Funding Human Embryonic Stem-Cell Research within FWP 6?*) discussed the various stakeholders involved in embryonic stem-cell research,

⁴ The US Fulbright programme for example has had tremendous influence on the formation of new elites in Central and Eastern Europe.

while Martin Peterson (*Political Food*) focused on genetically modified organisms and organic farming, both issues that affect not only the current EU Member States but future members and other European countries cooperating with the EU as well. Moreover, the position of SMEs and third sector organizations in Poland (*The Enlargement Reality? Reflections on Disappointment of FP Participants From the New Member States* by Tadeusz Zoltovsky and Stanislaw Walukiewicz and *The Role of a Science Supporting Foundation in Facilitation of the European Integration Process: A Polish Case Study* by Maciej Grabski and Tadeusz Zoltowski) were discussed to reveal what impact European integration has had on them.

3.1. A Sample of Stakeholders

Embryonic stem-cell research (STC) has been debated for quite some time, and not too long ago, the funding of such research within the framework of FWP 6 came on the agenda. The discussions were not centred on the amount of funds to be made available for embryonic stem-cell research (approximately € 5-10 million over a period of four years), but rather questions relating to religion⁵. While ethical questions are usually linked to subsidiarity of the individual Member States (for example, transplantation of human tissues and organs, etc.), the funding of embryonic stem-cell research within the Framework Programme falls into the domain of European decision-making.

The main stakeholders or participants in the debate on stem-cell research include the biotech industry, the Catholic Church and patient organizations. In the UK and the Scandinavian countries, industry is lobbying in favour of STC research, while the Catholic Church is strictly against it in Austria, Ireland, Spain and Portugal. That is, in Member States in which the Church continues to play an important role and the biotech industry is rather weak, the Church is more successful to impose its oppositional views toward STC research than in countries in which the Church has little influence. It is therefore essential, in Pichler's view, to ensure the inclusion of all relevant stakeholders and to broaden the debate so it can take place on a large scale. As the debate stands now, big bio-tech industries and the Catholic Church are 'dictating' the debate, and pushing other stakeholders such as patient organizations (Diabetes, Parkinson's disease, etc.) to the sidelines. Pichler predicts that a spill-over from the debate at European level could occur to the Member State level. These debates are bound to focus on fundamental religious convictions and the possibilities of saving lives and the question of economic profit. The outcome is left to speculation, but perhaps compromises can be made at national or perhaps regional level (for example, the city of Seville is in support of STC research, while most of Spain is not in favour of it).

A similarly controversial issue is the restriction of GMO products and related questions in agriculture that European enlargement brings with it and that must be dealt with. These questions include conditions relating to ownership and control of marketing processes, the so-called 'bio-technology syndrome' and the future of organic farming. The question of market control is not only pressing by the new presence of western

⁵ Franz Pichler compares the debates with the religious confrontations during the Reformation in the 16th and 17th centuries.

European farmers who have established themselves in Eastern Europe, but also by agricultural-business interests in the eastern European food industry. With regard to the 'bio-technology syndrome', the state of bio-technology in eastern European science parks and other relevant research institutions must be clarified. Since restrictions regarding GMO products are gradually being eased on the European market as a consequence of genetic engineering, which has changed the entire gene setting in connection with special treatments of products for populated urban areas, the link between biotechnology and agricultural production are entirely new.

Organic farming represents the most dynamic and hence also the most tentative field. It has long been viewed as an alternative way of farming at the same time as it in many aspects represents a return to farming conditions before 1950. The future of European and world agriculture may be dependent on successful organic farming in Europe with its industrially destroyed ecology and artificial surplus mountains that distort the world market. The response by eastern Europe will determine the future of the increasingly politicised European food sector.

Though there is a genuine expectation that the EU enlargement will have a positive impact on global competitiveness of the EU, this does not hold true for all actors involved on either side of the equation. As Tadeusz Zoltowsky and Stanislaw Walukiewicz point out, several sectors on the 'demand side' of the innovation system in the 'old' EU Member States, particularly SMEs, are increasingly under pressure from their counterparts in the 'new' members, who are pushing for success, realizing their competitive advantage and securing their share in innovation systems on different governance levels. In other words, many SMEs in the 'old' Member States will be faced with stiff competition, while on the other hand, SMEs in the new Member States will be confronted with several challenges at the outset but be increasingly propitious in the long-term. Competitiveness will arguably rise, with the least competitive enterprises going out of business.

With regard to the 'supply side' of the innovation system (R&D institutions, universities, research organizations, etc.), the EU's position on the Lisbon Strategy goals, especially when it comes to enhancing the competitiveness of the EU, will have to be taken into account. Adhering to the Lisbon Strategy objectives will be particularly difficult for the 'new' Member States as it is questionable whether they have the capacity to contribute to the implementation of these objectives and convert the EU into the world's most competitive region by 2010. The role of the cohesion policy is giving way to a disposition to strengthen more competitive and technology advanced regions in order to achieve the Lisbon Strategy's objectives. This would however deepen the division of Europe along the development lines and exacerbate the already existing controversies among the Member States.

The development of the EU from a free trade zone to a social, economic and political union is progressively paving the way for the Third Sector to enter the policy-making arena. Particularly in the CEECs, the transformation promoted the establishment of third sector organizations, such as the Foundation for Polish Science (FNP) founded in 1991 as an independent, self-financing non-profit institution. These third sector organizations provide a number of services, predominantly stimulating social needs and

promoting civil society. The organizations operating as private-public partnerships are integral to the transformation of the CEECs, as they strengthen the state's respective sectors. The integration of the CEECs in the EU will enhance further development of the third sector, which will arguably play a crucial role in adapting new methods of governance.

As is the case in all new Member States from eastern Europe, research institutions in Poland are at a critical stage in the process of adaptation to the European structures. SCI-TECH within the PHARE programme was a key instrument in preparing Poland for accession to the European Union. Among the many aspects to be considered within the framework of SCI-TECH is the optimisation of the RTD system as a key factor on which Poland's international competitiveness depends on most. The SCI-TECH programme's aim was to reform and utilize Poland's science and technological development potential more effectively and support and strengthen Polish S/TD administration while preparing for accession.

SCI-TECH's objectives included:

- support for further development and implementation of a national science and technology policy, especially with regard to the preparation of accession negotiations;
- preparing the R&D sector for Poland's future EU membership;
- assistance for further development of institutional systems for technology support and the development of Poland's science and technology information infrastructure, and
- support for increased interaction between basic and applied research, higher education and enterprise sectors.

On completion of the SCI-TECH programmes, CRIT and FEMIRC, the Foundation for Polish Science decided to continue funding efforts toward maximizing the implementation of the results of these programmes, which were no longer eligible for funding due to PHARE's new orientation. The FNP continues to support the systemic reform of science and technological development in Poland and has played an important role in preparing the Polish scientific sector to operate in the European Research Area. The Foundation runs the *European Integration Exploratorium Programme* which aims to:

- study and research the European integration process, focusing on harmonization of the organizational framework and financial support for science, technological development and innovation in Poland and optimising the use of the Structural Funds designated for these sectors. Research findings and analyses will be published in the form of opinions and reports;
- prepare analyses, evaluations and comparative studies, and set out trends in the strategies applicable to science, technological development and innovation in Poland, with due respect to European integration, and

- keep an archive and provide access to the records and materials of the PHARE SCI-TECH programmes, collect records and data with relevance to the European integration in science, technological development and innovation sectors.

The Exploratorium also monitors Poland's science policy development in line with the Community guidelines on S/TD, focusing on potential benefits for the science sector from scientific cooperation on a European level. Strategic research is carried out for Poland's S/TD policy in the context of the Lisbon Strategy and scientific support and counselling provided to governmental and regional institutions toward efficient use of the Community transfers (i.e. Structural Funds) allocated for projects which involve linkages between economy and science.

3.2. What Can the Users Expect and What Can Researchers Deliver?

Awareness and acceptability of research results are an increasing concern of the European policy makers in general, and the European Commission in particular. A key question to address is: what are the expectations of users and what are the possibilities of science and research to fulfil these expectations? The notion of 'knowledge producers' is very broad – there are different modes and paradigms in different branches of science, as well as different groups of users in economy, policy and society. Industry-research interactions might differ from policy-research interactions with regard to both expectations and outputs. Given this, it is important to reflect on whether the notions of 'dissemination' and 'awareness' are indeed the right ones to be using. A better mutual understanding of possibilities of science and research, on the one hand, and of the users on the other, should indicate new pathways for realistic visions and concepts.

Research takes place in various arenas operating under different conditions. One major difference is between research taking place at universities and at research centres, though there are also important differences between large national research centres that operate under a different framework than private ones. Private, non-profit associations and foundations must also be distinguished from consultancies. Aside from the structure of the different research organizations, the national framework also plays a significant role. Thus, for example, universities are major players in research activities in the UK, whereas in other countries research centres play a much more important role. Relevant to this is the problem of research funding – different funding opportunities create functional differentiation in the respective national environments and recent reforms will have a major impact on the functional distribution between the different research actors.

As Norma Morris points out in her paper *Defining and Constructing Users*, the term 'user' is ambiguous as it applies to different 'social categories', including government, industry, academics, the general public, etc. These so-called social categories differ from one another in their social and contractual relationship to research. That is, across and within these categories, there are differences in expectations, thus requiring researchers to distinguish between different kinds of users, if those users' expecta-

tions are to be met. Direct users of research results (e.g., commercial firms, executive departments of government commissioning work or recommendations to resolve a particular problem, etc.), and those who use research as part of a strategy towards achieving a wider aim (e.g. government promoting research to stimulate economic growth, or industry making use of collaborations for their networking or recruitment potential). These may be called short-range or long-range users of research, and they stand at opposite ends of a spectrum of user/researcher relationships.

The high level of dissatisfaction in the policy making community, based on perceived shortcomings in the way that researchers conduct their investigations and convey their findings, is set against the complaints of researchers about unreasonable demands placed upon them in relation to time, scope and practicality of their work. Research and science policy mechanisms have been developed to address these concerns, with most such initiatives adopting a linear model of knowledge transfer from researcher to research community. In relation to the transfer from the expert to the non-expert, the user and interested public, that linearity can also appear hierarchical, with knowledge passed down from the top. Ian Forbes (*Translating Knowledge: User and Researcher Collaboration for Policy Relevance*) emphasizes that the results can consequently be damaging for all parties – users resent paying for and receiving output that has no new information and little use value, while researchers feel that their best efforts are denigrated and insights ignored. Both user and research communities are liable to feel dissatisfied and de-skilled, and antagonistic to the needs of the other.

New approaches, meant to address these problems and enhance the collaboration of sets of actors who are in a symbiotic relationship as regards knowledge production, have emerged in the past few years. Most evident is the drive for evidence-based social science policy-making, and the concept of technology transfer to establish productive synergies between industry and researchers. Both of these initiatives have met with mixed success.

The ongoing concerns of the social science policy-making community suggest that the currently dysfunctional relationship between users and researchers will continue. Current mechanisms – advertisement of expressions of interests, written submissions responding to tender documents, specified funding priorities and themes – do not require or encourage this essential communication, and can serve to lock both communities into their own language and practices. The open market of competitive bidding is far from producing a double coincidence of wants. Drawing on the developments that have taken place with the technology transfer model, the situation requires mediation rather than new techniques. The principal mediation task according to Forbes is to ensure that high quality communication on a number of key items takes place. First, the nature of the *needs* of each community must be transmitted and understood. Second, the differing forms of knowledge with which each group is engaged must be specified and acknowledged. Third, the specialist and historical knowledge available to each of the groups must be recognized and respected. These are the prerequisites for communication about the development and conduct of research that meets the differing needs of all parties and identifies overlapping interests. This, in short, will not routinely take place without a ‘translation’ function being inserted into the process.

In France, the necessity to connect policy makers with researchers in social and human sciences has been clear for some time. In the context of a high level of unemployment, the failure of public policies seems partly due to the lack of knowledge - unsuitable statistical tools, weakness of assessment devices and lack of knowledge about experiences of other countries. The Research Unit created within the French Ministry of Labour in 1993 has been trying to provide answers and to deal with this lack of knowledge by developing links between policy makers and researchers. Serving as an interface between these two worlds (policy makers and researchers), the Research Unit has been trying to stimulate research in the fields of employment, labour and vocational training and to raise policy makers' awareness to the results. Consequently, the institutional (i.e. the Ministry) and social (trade unions) 'demand side' has been connected to the 'supply side' (research organizations). Though the Research Unit's creation has provided some successes, the results are mixed. Policy makers and researchers have developed regular relationships, however these are only on a temporary basis. A lack of understanding still remains which reveals that a new kind of mediation between policy makers and researchers (the demand and the supply side) is now necessary.

In short, recent developments have placed greater focus on the social and economic impacts of research at policy level. It is, in the words of Tiago Santos Pereira (*Managing Research or Governing Research? Research Institutions at the Crossroad*), not only the role of (research) institutions, but also the understanding of research that is being redefined. Research is no longer a synonym for 'ivory tower'. While the trend for greater accountability of research is not new, two different dynamics have developed in parallel. On the one hand, researchers are increasingly expected to not only produce economically relevant research results, but also to contribute to the exploitation of those results. This new 'approach' no longer focuses on discussions such as basic vs. applied research, but is instead drawn to the commercialisation of research, patents, spin-offs and entrepreneurs. The institutionalisation of such processes has resulted in the creation of offices which manage research portfolios for numerous research institutes, guaranteeing IPR or licensing technologies. An indicator of this dynamic has been the increase in public sector research patenting trends.

On the other hand, and partly in line with public controversies on scientific and technological issues, researchers are increasingly called on involving stakeholders in their research practices and in the definition of their research agendas. While science policy was often considered an internal affair of the scientific community, 'outsiders' increasingly want to participate and new forms of participation are being developed. While such processes are not fully institutionalised, research institutes see themselves confronted with implementing new ways of governing their research agendas.

According to Adolf Filacek (*Assessment of Research and Innovation Activities: Experience Gathered in the Survey of Entrepreneurial Subjects in the Czech Republic*), the innovation process is comprehensive, involving a broad range of factors including research, discovery, experimental development, imitation, adjustment and commercialisation of new products, production processes and organizational forms. The current innovation policy in the advanced (Western) states (Lundvall, Borrás, 1997), which constitutes an alternative to the previous research and technology policy, places

not only science and research, but also economic innovation at the centre of attention, which depends – to an ever greater extent – on research results, but also on the quality of the development of business activities and on the ability of individuals, companies and regions to adjust to permanent changes. Innovation is a central phenomenon of industrial dynamics. The Czech Republic does not yet have a precisely formulated concept of innovation policy and thus no experience from its practical implementation on a nationwide scale. Partial improvements may be achieved with the drafting of the National Focused Research Programme, if links between science policy and the innovation process are elaborated. The growing costs of innovation activities are conducive to promoting cooperation among companies, even among competing companies. Most companies do not have enough resources to finance costly innovations and consequently, innovation networks are formed in which producers cooperate with research laboratories and consumers.

Innovation can be understood as an interactive social process which is linked to education and skills acquirement. This presupposes communication and interaction among individual links of the innovation process, among individual agents, as well as business enterprises. Through education and skills acquirement, a dimension of tacit knowledge (Polanyi, 1962; Lundvall, Borrás, 1997) is being absorbed in the innovation process. The significance of this tacit knowledge, which emerges in the specific knowledge of the topic in relation to the experience of the researcher and the flexibility of the research strategy selected, and to the selective data interpretation, is continuously increasing. The spread of new information technology increases the number of available data and information, and thus it is necessary to make a continuous selection, which ought to be carried out by experts. Once this selection procedure is completed, the newly codified scientific and technological knowledge becomes applicable and available to potential users. The problems with tacit knowledge transfer is one of the most central causes for long-term technological disparity among individual regions and countries. Due to the growing significance of tacit knowledge it follows that it needs to be pursued by increasing competence and focusing on basic research.

One consequence is the capacity of research to form key skills and abilities in the contexts in which tacit knowledge also plays a role, which is inevitable for the formation and mastering of innovations. Science and research represent the mode of education and cultivation of a highly competent working force. A society dedicated to the production of innovations needs theoretical knowledge not only in the sense of codified information, but as a dynamic, continuously regenerating system of knowledge and skills. Industry, science, technology and innovation policy in the developed countries of the EU are moving from goal-oriented support towards forming framework conditions for the growth of competitive abilities, stimulating innovations and creating the information infrastructure. Capital, technological knowledge and work have become more mobile and seek favourable locations. Company competition with regard to market placement and technological primacy is increasing.

In light of these changes and developments, a survey of businesses was carried out for the project *Intellectual, Social and Human Dimensions of the Science Evaluation and Their Implementation in the Innovation Activities in the Czech Republic*. The purpose of the survey was to acquire concrete information on the current condition of sci-

ence, development and innovation activities of the companies active in the Czech economy. Two types of organizations were selected for the survey:

1. Organizations immediately concerned with creating or developing innovations (science, research and development). Taken together, the group was designated as “R&D subjects”;
2. Subjects immediately applying innovations or taking part in their creation or application, i.e. production (manufacturing) organizations, designated as ‘companies’.

Nearly 90 per cent of respondents viewed the quality of their activity as comparable to international standards. None of the respondents felt their output was below average in comparison with that of foreign companies. Half of those questioned considered their work as average while one third classified their activities as above average. Two-thirds of the organizations surveyed are international ‘players’, agreeing that the importance of national networks has declined while collaboration with both European and global networks has increased. The results of the survey indicated that production and innovation firms believe that there is a good chance for the Czech Republic to “find its way” to the market by means of high technology. It would, however, be essential to support this process through direct or indirect investments, particularly for selected research and development sectors.

3.3. Centres of Excellence

Centres of Excellence are tools to promote the development of creative research environments. They are supposed to represent the cutting edge of their respective field. Centres of Excellence as a tool was developed in Scandinavian countries in the early 1990s, and during the last decade, this approach has spread widely and is used today as one of the key tools of science policy in a number of countries. The EU has also promoted this approach through supporting science and research in the new Member States.

A *Centre of Excellence* comprises one or several high-standard research teams with shared and clearly defined research goals, and has a good potential for reaching the international forefront in its field, as well as for developing economically and/or socially important innovations. Accordingly, Centres of Excellence comprise both scientific excellence and practically oriented goals. Many of them are networks of university research teams and of end users of research results (e.g. medical and social organizations or enterprises). The crucial elements for the success of such centres are the right combination and focus on:

- long-term goals and focused actions;
- creativity with effectiveness and efficiency;
- openness and rapid dissemination of results, and
- inclusion of able stakeholders.

As Eino Tunkelo (*Centres of Excellence: Experiences in Establishment and Performance; Aiming to new Collaboration/ End-User Relations*) asserts, the most difficult aspect for a Centre of Excellence is to create and also sustain its “cutting edge” and to avoid becoming an ‘ivory tower’. Andrei Rezaev (*Evolving ‘World Calibre’ Research Institutes in the Enlarged Europe: Problems and Prospects*) addressed the problems and prospects of what he calls ‘world-calibre’ research institutes in an enlarged Europe. If the ‘old’ and ‘new’ (and even future) Member States aim to build research systems based on this ideal of ‘world calibre’ institutes, they will have to carefully assess their needs, resources, and long-term interests. For a research institute to be described as a ‘world-calibre’ it must be involved at a global level, i.e. a research institute that operates in the global context and competes with the best research institutes in the world, and aspires to reach the pinnacle of excellence and recognition. Research organizations operating on the national or regional level are confronted with different realities than those ‘world-calibre’ institutes face – the research work of the former relates to the needs of the immediate society and economy and implies responsiveness to local communities, while ‘world calibre’ institutes have a much broader range of work.

Research institutes, university managers and policy makers in Europe are seeking best practices in terms of research and training system governance. Recent publications in sociological literature reveal a need for counterbalancing the strong influence of the American model. Though the American model is to a certain degree very attractive, it also has drawbacks, especially in terms of governance if it were adopted in wider Europe. It is therefore useful to study the essence and nature of educational and research governance on a theoretical basis with regard to the current socio-economic transformations in Europe, the new world order and multiculturalism. It would furthermore be important to have a clear theoretical understanding of government formation and have a comparative perspective on the reality of current governance structures in ‘Western’ and ‘Eastern’ European spaces, and to look closely to European theoretical and practical traditions in the formation of new governance structures.

4. The European Research Area and the Framework Programmes

4.1. Introduction

Since the mid-1990s the European Union has supported collaborative policy-oriented research carried out by European social scientists through its Framework Programmes FP4 and FP5. A key objective of EU social science research policy was to achieve “European added value,” although the meaning and implications of this notion were neither precise nor well understood. From the perspective of the European Commission, bringing together social scientists in EU funded research projects was thought to add ‘European value’ (relative to other funding agencies) in at least three respects:

1. projects brought together scholars from different countries to deal with social, economic and political issues whose relevance and importance transcended a single country (thus *transnationality*);
2. partners frequently brought a range of disciplinary perspectives to the consortium and were expected to approach the topic under investigation from more than a single scholarly vantage point (thus *interdisciplinary*); and
3. proposed projects were explicitly organised around themes and issues that the Commission had defined in advance and which addressed public policy issues of relevance to the European Union (thus *targeted, applied research*).

In 1994 when the EU's Council of Ministers established the Fourth Framework Programme for Research, Technological Development and Demonstration (FP4), the main aim was to establish a common science and technology policy in Europe. In the area of the social sciences (which received a relatively minor portion of the overall 13 billion EURO budget), the key policy instrument for achieving this goal was the Targeted Socio-Economic Research (TSER) programme. TSER sought "to invest in knowledge, research and human resources in order to enhance the social and economic development of Europe." Specifically, the aim was to build up a policy relevant knowledge base and facilitate research networks for high quality, comparative socio-economic research. TSER was implemented in three successive calls for proposals that resulted in the funding of a total of 162 projects. These social science projects fell into three main content groups and two funding types:

1. Science and technology policy options: 59 RTD Projects and 5 Thematic Networks;
2. Education and training: 30 RTD Projects and 6 Thematic Networks; and
3. Social exclusion and social integration: 49 RTD Projects and 13 Thematic Networks.

The Fifth Framework Programme (FP5) expanded the horizon, breadth and depth of the Commission's interest in social science research. The Key Action "Improving the Socio-Economic Knowledge Base" was defined as the Commission's major policy instrument to mobilize social science researchers from different disciplines to contribute to solving key challenges facing Europe's economy, polity and society. These included, for example, improving the management of societal change, providing forward-looking policies concerning employment and unemployment, enhancing social cohesion, providing new perspectives on learning, considering new forms of governance and citizenship, and dealing with EU enlargement. With a budget of 165 million EURO, and by means of 3 calls for proposals, over 200 social science projects were funded under FP5.

The Commission's support of comparative, multidisciplinary and targeted social science research – as implemented by the work programmes established under FP4 and

FP5 -- was intended to be both value-enhancing and distinctive. By moving beyond the confines of national research agendas; by explicitly addressing salient European policy issues; by enabling social scientists throughout Europe to meet, exchange and collaborate together; by emphasizing innovative strategies for policy intervention -- all these elements (and others) were assumed to add considerable value to Europe as a socio-economic entity. Indeed, by their very conception and operationalisation, EU funded social science projects would not only contribute to the development of a European social science community, but also enhance and enrich the public sphere of policy deliberation and implementation. Such objectives were simply not feasible when cast in contrast to social science research funded by national or other European agencies. These elements represent the Commission's underlying "philosophy" of why European social science research needed to be supported.

Collaborative research carried out in the FP5 Accompanying Measure *European Dimension: Towards a European Research Arena -- How to Achieve European Added Value in Transnational and Interdisciplinary Socio-Economic Research -- Lessons Learned From the 4th and 5th Framework Projects* sought to discover the understandings, strategies, and solutions that have accumulated in FP4 and FP5 social science consortia. From the perspective of project co-ordinators, the development of a European social science community is best served by supporting comparative, transnational research *within* the EU and finding ways to facilitate co-operation among European researchers. The idea of creating European data archives is also regarded as relatively important, although the variance on this issue is higher than other issues implying that its importance is contested among co-ordinators. Policy related activities are viewed as activities of medium importance. Finally, activities that are not directly related to the EU research and policy community -- for example, improving cross-disciplinary approaches and addressing topics and trends with non-EU countries -- are seen as less important, despite their emphasis by Commission officials and evaluation guidelines.

However, beyond specifying which activities most contribute to the development of a European social science community, there is the larger question of whether, and in what ways, the Framework Programmes have actually influenced the social sciences in Europe. Especially informative in this regard were co-ordinator responses to an open-ended question that asked: "How, if at all, has EU funding of social science research changed or restructured the research carried out in your field of expertise? Please give an example or two of how social science programmes in FP4 or FP5 have influenced research undertaken in your field of inquiry." The results were presented at the SEMMERING conference by Aaron Benavot in his paper entitled *What is European About EU Funded Social Science Research: The Perspective of Project Co-ordinators*.

Taken together, the respondents' answers tell a rich, instructive and overwhelmingly positive story of how the Framework Programmes have altered the landscape of the social sciences in Europe. While the impact of EU funding of comparative social science research apparently varies by discipline and fields of inquiry, the vast majority of co-ordinators view EU funding of social science research as having brought about very positive benefits. Many mentioned that comparative research had been en-

hanced, especially in their specialized fields of inquiry (e.g. unemployment research, analysis of labour markets, migration and ethnic relations, poverty, public accountability). In addition, they noted that international comparisons, including qualitative ones, had increased. The emphasis on comparative, transnational research “contributed to the conceptualisation and operationalisation of concepts that are applicable to [different] EU countries”; they contributed to applying “the same design in each country and to a unified collection of data.” Such comparative research helped towards “integrating quantitative and qualitative approaches”, “giving research a more structured character” and “promoting new methodological instruments such as biographical research.”

Overall, and notwithstanding some critical comments, the vast majority of project coordinators leave little doubt that EU funding of social science research projects has meaningfully altered social science research in Europe. Funding opportunities have increased; new research questions have been formulated; new social, economic and political contexts have been studied and compared; the methodological toolbox researchers utilise has been enriched; more scientific collaborations that transcend disciplinary boundaries have been conducted; research networks have been reconfigured; researchers have found innovative ways to integrate user groups and stakeholders into their projects; and research findings have been disseminated and discussed in increasingly diverse formats. If anyone needed convincing evidence that a dynamic European Research Area in the social sciences is already alive and kicking, in no small measure due to EU funding of comparative research projects, they need only listen to what key actors on the ground (i.e. EU project co-ordinators) are saying.

With regard to the funding of European research, new models are emerging for the structure of European research finance. The late 20th Century model was one of the separate developments of the EU Framework Programme within DG XII (now DG Research), on the one hand, and of national research funding within national boundaries by national ministries of research and research councils, on the other. Stimulated perhaps by the change in rhetoric in the European Commission’s years 2000 vision for a European Research Area at least two alternative models have begun to emerge. The first leaves in place the separate EU and national institutions and processes, but seeks to add a third actor, a European Research Council (ERC) to provide pan-European support for basic research and building research capacity. A European Research Council Expert Group (ERCEG) was set up during the Danish EU Presidency on the initiative of the Danish Minister of Science, Technology and Innovation. The group was set up in response to debates held on the status of the European Research Area in the Council of Ministers in November 2002. The expert group’s objective was to examine the scope and possibilities of a European Research Council.

The ERCEG’s recommendation is for the European Research Council to be sponsored and funded mainly by the EU and that it should be accountable to the EU and other funding partners. The ERC should be guided by the European scientific community. The expert group maintains that the ERC’s main task should be to strengthen the European Research Area, “to overcome fragmentation of efforts; and to encourage high scientific quality through competition on the European level within all sciences including the humanities and social sciences”. (ERCEG, 2003). The Council’s is also foreseen to provide advice on scientific issues to governing EU institutions and pro-

mote science and research education and training jointly with national governing bodies to enhance scientific culture across Europe.

This ERC model has two variations, one based on the expansion of the existing European Science Foundation and the other on a new institution within the framework of the EU Treaty.

The second model may be closer to the spirit of the ERA vision of partnership between institutions, though equally as difficult to achieve as a European Research Council, according to Chris Caswill (*Mobilising the Money: New Funding Networks in the European Research Area*). Here a new basis for European Science is built on cooperation and convergence between very diverse national funding systems and the EU. In a small corner of the current Sixth Framework Programme, a funding scheme has been established to encourage this approach, under the title *ERA-NET*. A consortium of seven national Research Councils with responsibility for social science has been formed to develop this model, and to bid for ERA-NET funding (NORFACE – New Opportunity for Research Funding Agency Corporation in Europe).

4.2. Experiences with the Framework Programmes

Estonia actively participated in the 5th Framework Programme, the success rate of projects including Estonian participation being at 27 per cent (223 successful projects from 810 submitted proposals). At the same time, the preliminary results of FP6 (success rate at 9,9 per cent) has raised questions about the prospect of future international collaboration. 106 Estonian organizations that participated in FP5 were surveyed to arrive at results on their experiences with the EU's Framework Programme. When these organizations first began participating in the FPs, the majority cited obtaining additional financial resources as their main reason for participating, while as time went by, finding new partners and acquiring new knowledge became a more or equally important objective for participating in the Framework Programme. It can be concluded that positive changes in attitudes from quantity to quality are under way, according to Ülle Must (*The Role of the European Framework Programme in Estonia's Cooperation Arena*), but the low success rate in securing participation in FP6 may decelerate this positive process.

The new Member States have a long tradition of participating in the Framework Programmes though on a quasi-regular basis. They won appropriations from central budgets to co-finance the FPs, strongly supported by the PHARE funds. The FPs were fully recognized by respective governments and approved by the national scientific communities. Beginning with a rather poor amount of projects and low success rates at the beginning of the 5th Framework Programme, the new Member States increasingly began contributing significantly to research activities. Under the 5th FP there were some 30,000 research projects with relatively small budgets and at duration between 2-3 years.

The *Integrated Projects* introduced in the Sixth Framework Programme were designed to integrate excellent research teams to solve complex problems in a longer period of

time (3-5 or even 7 years) with corresponding substantial budgets (up to EUR 20 million). In turn, a *Network of Excellence* is a specific research institution “without walls” which integrates excellent scientific teams to set up standards for carrying out research. Following the first call for proposals within the framework of FP6, it became evident that the difference between Integrated Projects and Networks of Excellence was actually quite small. Furthermore, the meaning of ‘excellent’ in social science is highly disputable and numerous scholars believe that it is actually not possible to standardize social science. 70 proposals were received for the first call under Priorities 5 and 7. According to the rule, ‘the winner takes all’, only five proposals had a chance to qualify for funding. In one research area, no proposal passed the threshold, i.e. there were only 4 “winners”. 14 proposals were above the very high threshold (80 points out of 100). With that, the success rate in the first call was extremely low (5,7 per cent or 4 out of 70). Even if a proposal passed the high threshold, it was considered average and thus had a very low chance of receiving funding.

However, given the actual heterogeneity within the European research area, transnational research funding is a strategic task. Through the Framework Programmes, the European Commission has gained a high reputation as capable of dealing with diversity in research cultures. With regard to the Sixth Framework Programme, criticism has been raised with regard to the transparency of the procedures, the evaluation process (including the selection of evaluators) as well as the implementation of the New Instruments (Pohoryles, 2002). There are claims for a reform of the procedures applied by the Commission (Pohoryles, 2003), as well as for an entirely independent European Research Council, following the example of the ESRC or the NSF (Sapir et al., 2003). An intermediate position is held by those who ask for an additional independent fund for generic research (Nijkamp, 2003).

In his presentation *Olympic Games or Research Policies: What “The Winner Gets All” Philosophy Does to the European Research Area* Ronald Pohoryles criticized the “winner takes all” mentality of the new instruments. According to him, they pose a dangerous threat to the concept of the European Research Area, with the problematic outcomes of the first call of the Programme providing preliminary evidence of this. The failure of the “winner-gets-all” principle is well illustrated by the fact that despite the high threshold already applied during the evaluation procedure, only around 25 per cent of the successful bidders actually received funding. This in turn means that 75 per cent of the highest performing researchers and research organizations were excluded from the programme.

Another principle question regards the evaluators and their selection. Though DG Research called for a transparent procedure for the selection of experts/evaluators in response to the White Book on European Governance, the procedure remains very intransparent. The consequence of all these hurdles encountered is that the readiness of European researchers to collaborate in Framework Programme decreases dramatically. Furthermore, regional disparities are very likely, leading to the regional balance undermining the general goals of the European Research Area. Experiences made by the new Member States, for example, point in this direction. In addition, there also seems to be some evidence that research institutions which used to form the European Research Area are now structurally disadvantaged.

The implementation of the 6th Framework Programme has been critically reviewed by the European Commission ("The European Research Area: Providing New Momentum", 2002) with reference to the Lisbon targets. An even more critical review was published in a report prepared by an independent high level study group established on initiative of the President of the European Commission (Sapir et al., 2003). Questions tackled with reference to the concerns regarding the new instruments included whether the implementation of the 6th Framework Programme would lead to closed shops within the research communities and whether the new instruments discriminated against smaller countries, the new Member States or specific types of institutions.

Thus far the implementation of the Sixth Framework Programme is threatening to endanger the very targets proposed by the Commission's *Communication on the European Research Area*. The High Level Expert Report to the President of the European Commission (Sapir Report) dealing with the shortcomings of the Lisbon strategy calls for an independent research council, implicitly criticising the procedures applied by DG Research. Corrective action is in any case necessary.

5. Conclusions

The purpose of the eighth SEMMERING S&T Forum was to gain an understanding of the changing role of science and technology in modern societies. As science and research are long-term oriented but the need of potential users might be quite urgent, an increasing part of scientific work is carried out in specific user-provider networks which are at the same time long-term oriented, but can assure short-term advice. Also relevant to this is the shifting boundary between traditional universities and research organizations, new types of research institutes and consultants and new types of networks comprising user, researchers and mediators.

In March 2000, the Lisbon European Council took a first step toward establishing a common science and technology policy by adopting the European Research Area. The EU has acknowledged that in establishing the European Research Area, it is essential to improve the EU's competitiveness through promoting the knowledge base, thus making the EU the most competitive and dynamic knowledge-based economy worldwide. As acknowledged by the European Research Council Expert Group, "an emphasis on increasing European competitiveness and on achieving growth through investment in research and education (as argued e.g. in the recent Sapir report) may not be sufficient to reach the ambitious political goals set out [...]" (ERCEG, 2003b). As the papers presented at the SEMMERING Forum pointed out, a lot of work still lies ahead. It is essential to facilitate and advance the spill-over of knowledge and innovation networks and to ensure that a broad variety of actors are included in the European Research Area, considering that the production of scientific knowledge today no longer is the exclusive domain of universities and research institutes.

Collaboration is another area that needs improving, if the ERA is to fulfil its objectives of increasing European research's dynamic. Member States by and large have their

own research policies and structures which - though of a high standard - are quite fragmented on a European level. A 'collaboration culture' between the 'old' and 'new' Member States is still in its infancy and will have to be further developed and promoted. Closer relations between different organizations and institutions (science, economy and policy) will have to emerge, a common system of references built and RTD policies converged at national and EU level to remove the day-to-day legal and other barriers. Collaboration with candidate states, as well as other European states should be considered so the lack of specialists in certain areas within the EU can be (at least partially) compensated.

Aside from promoting a collaboration culture at the European level, the currently dysfunctional relationship between users and researchers must be tackled. To improve this relationship mediation in the form of high quality communication on a number of key issues is required. Only then will researchers and users be "connected" and be able to contribute to the goal of increasing the EU's competitiveness and the creation of a strong knowledge base. In short, a number of intertwining links and relationships between the 'old' and 'new' Member States, between research networks and between users and researchers must be strengthened and enhanced before the European Research Area will be able to thrive and fulfil the objective of making the EU the most competitive and dynamic knowledge-based economy in the world. The eight SEMMERING Forum touched upon several options on how this strengthening and improving of linkages between the numerous actors can be achieved and what is necessary to ensure that the European Research Area is successful and realizes its full potential.

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