EUROPEAN TREND CHART ON INNOVATION

Thematic Trend Report:
"Technology Transfer"

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The European Trend Chart on Innovation

Innovation is a priority of all Member States and of the European Commission. Throughout Europe, hundreds of policy measures and support schemes aiming at innovation have been implemented or are under preparation. The diversity of these measures and schemes reflects the diversity of the framework conditions, cultural preferences and political priorities in the Member States. The "First Action Plan for Innovation in Europe", launched by the European Commission in 1996, provided for the first time a common analytical and political framework for innovation policy in Europe.

Building upon the Action Plan, the "Trend Chart on Innovation in Europe" is a practical tool for innovation policy makers and scheme managers in Europe. Run by the "Innovation" directorate of DG Enterprises, it pursues the collection, regular updating and analysis of information on innovation policies at national and Community level, with a focus on innovation finance; setting up and development of innovative businesses; the protection of intellectual property rights and the transfer of technology between research and industry.

The Trend Chart serves the "open policy co-ordination approach" laid down by the Lisbon Council in March 2000. It supports policy makers and scheme managers in Europe with summarised information and statistics on innovation policies, performances and trends in the European Union. It is also a European forum for benchmarking and the exchange of "good practices" in the area of innovation policy.

The "Trend Chart" products

The Trend Chart on Innovation has been running since January 2000. It tracks innovation policy developments in all EU Member States, plus Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Iceland, Israel, Latvia, Liechtenstein, Lithuania, Norway, Poland, Romania, Slovak Republic and Slovenia. The Trend Chart web site (www.cordis.lu/trendchart) will provide access to the following services and publications as they become available:

- a database of policy measures across Europe;
- a "who is who?" of agencies and government departments involved in innovation;
- a series of country reports;
- a series of six-monthly trend reports;
- a number of benchmarking reports on specific themes;
- statistical reports such as the European Innovation Scoreboard;
- the six-monthly newsletters of the Trend Chart;
- the annual reports of the Trend Chart;
- and other publications.

The present report was prepared by M. Boden, J. Butler, P. Cunningham, and A. Salazar, from PREST (University of Manchester) and based on information gathered by a network of correspondents co-ordinated by Paul Cunningham. The information contained in this report has not been validated in detail by the Member States or by the European Commission.

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1. Executive Summary

1. Successful innovation depends upon the generation of new ideas and knowledge. These depend greatly upon the existence of a strong and diversified science base, supported by a modern research infrastructure, which, in turn, is dependent on government support. In 1995 the European Commission's *Green Paper on Innovation* identified factors on which innovation in Europe depends, and to formulate proposals for measures which could increase the innovation capacity of the European Union.

2. Against this background, this thematic report examines developments in innovation policy concerning improvement of "the link between research and innovation", an area which may be broadly described as "technology (and knowledge) transfer". The broad definition used here implies the "vertical" shift of ideas from the science base and their uptake by industry for incorporation into improved products, processes and services, rather than the "horizontal" transfer of knowledge between companies. The report covers innovation policy developments and support measures, put in place between November 1999 and June 2000, and is based on the Country Reports produced by the Trend Chart Network of Innovation Correspondents.

3. There are a number of ways in which policy makers may influence the uptake of research results by industry. Indirect methods include the modification of framework conditions, to allow greater interaction between public sector research institutes and businesses. More directly, schemes exist to encourage collaboration between higher education institutes, public research organisations and companies.

4. This report focuses on those innovation policy developments which follow the more direct approach, namely those falling in Action Line III.4 (*Intensified co-operation between research, universities and companies*), which includes actions which aim to promote the dissemination of knowledge between research institutions, universities and companies and Action Line I.2 (*Mobility of students, research workers and teachers*), which covers measures, schemes and actions dealing with the mobility of students, research workers, engineers or scientists from one country or industrial sector to another, and from education or research to industry. Action Line III.5 (*Strengthening the ability of companies, particularly SMEs, to absorb technologies and know-how*) is closely related to the ability to transfer technology and exploit or appropriate its benefits, although is not its primary purpose.

5. Several countries have prioritised policy measures concerning the transfer and valorisation of research results between the public and private sectors, although the specific measures introduced vary according to existing national capabilities and research infrastructure. In countries such as Belgium, France, Ireland, the Netherlands, Sweden and the UK, which possess a concentration of high quality research capacities, efforts generally aim at increasing the number and effectiveness of the paths by which research knowledge may be utilised in the innovation process.

6. In Germany there are already a variety of such channels, while in Finland, there is close cooperation between companies, research organisations and universities. In other countries, it is recognised that both the basic research infrastructure requires strengthening and that interactions between research providers and industry need

improving. Examples include Spain, France and Portugal, where recent measures aim at reinforcing cooperation between the various actors

7. The policy mechanisms employed to promote and facilitate technology transfer can be further analysed in terms of three principle sets of characteristics: modalities of knowledge transfer, structural support mechanisms and targets. While these extend more generally to the full range of innovation measures, the intention here is to emphasise their technology transfer dimensions. A summary table of this framework of analysis applied to each of the countries is included in the report.

8. Modalities of Knowledge Transfer concern the ways in which policy promotes the transfer of knowledge between organisations and individuals. Structural Support modalities refer to the ways in which policy can influence the institutional structure for innovative activities in general, and in particular, promote the transfer and diffusion of knowledge. The Targets of policy mechanisms are the organisational types and levels at which policy mechanisms are aimed. These range from individual researchers through to large groupings of organisations, such as sectors and regions. These three sets of modalities may each be visualised as an axis or dimension, relative to which policy measures may be located.

9. This report also provides a brief Summary of the situation in each country. It is based on the evidence and interpretations presented in Country Reports. Information about the policy measures relevant to technology transfer are included in tabular form, prepared from individual template/datasheet information.

2. Introduction

2.1 Innovation – a categorisation

In December 1995 the European Commission published its *Green Paper on Innovation*[1], the objective of which was to identify the factors on which innovation in Europe depends, and to formulate proposals for measures which could increase the innovation capacity of the European Union. The *Green Paper* set out an extensive definition of the process of innovation, broadly defining it as a synonym for the successful production, assimilation and exploitation of novelty in the economic and social spheres. In the context of maintaining and strengthening competitiveness and employment (at all levels – regional, national, supra-national), the role of the firm in developing its innovation capacity was seen to be central. However, firms were not seen as isolated actors in the innovation system; the critical role of authorities was also recognised as was the need for close interaction between firms and other components of the innovation system.

The OECD also recognises enterprises as the main source of innovation, but notes that their performance is dependent on several other elements of the innovation system. These include the incentives provided by the economic and regulatory environment, firms' access to critical inputs and their internal capacity to seize market and technological opportunities[2].

Similarly, the process of innovation has many facets, of which key elements are research, development and the use of new technologies. In highly simplistic terms, successful innovation depends upon the generation of new ideas and knowledge, their uptake and development by firms and their transformation into new products, processes and services which fulfil market needs. Indeed, as Leydesdorff *et al* (2000)[3] note, innovation may only be defined in terms of operations at an interface and here several subsidiary factors can play a role. The production of knowledge depends greatly upon the existence of a strong and diversified science base, supported by a modern research infrastructure (equipment, facilities, etc.). In turn, this is dependent on government support, both through the direct provision of finance, and through framework conditions conducive to free-thinking research. The science base may be located within universities and similar institutions, in public-sector (i.e. government) research laboratories or in independent research and technology organisations, or a combination of all three. Firms, too, may contribute to the production of knowledge through their own R&D facilities, although generally an extensive coverage of all potential basic research options exceeds the resources available, particularly as the scientific content of innovation is increasing (OECD, 1999). Thus, as identified by Etzkowitz and Leydesdorff (1995)[4], three sets of actors – university, industry and government - may form a complex interrelationship (their so-called "Triple Helix") in the construction of systems of innovation at a variety of levels. However, in the context of this report, it is the interface between the science base and industry which forms the focus for examination, although Government is also an actor through the delivery of support mechanisms.

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[1] COM(95)688, European Commission.

[2] OECD, Working Group on Innovation and Technology Policy, *Managing Innovation Systems*, DSTI/STP/TIP(99)1, 16-17 March 1999.

[3] Leydesdorff, L., Cooke, P. and Olazaran, M. "Technology Transfer in the European Regions: Introduction to the Theme Issue". *Journal of Technology Transfer* (forthcoming).

[4] Etzkowitz, H. and Leydesdorff, L. (1995), "The Triple Helix of University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development", EASST Review 14 (1), 11-19.

In current debates on policy and its formulation, the development of networks and clusters of these actors (i.e. universities and research laboratories, and industry) is viewed as an optimal strategy for the promotion of innovation. In its review of innovation systems, the OECD notes that

> "Innovation increasingly relies on a well-functioning interaction between the science base and the business sector. The innovative process in all sectors is increasingly characterised by feedback between the science base and different stages of technology development and commercialisation. In some fields such as biotechnology, scientific research is the main source of innovation, blurring the distinction between science and technology. A greater part of the agenda of scientific research is driven by problems identified during the course of technological development in the business sector." (OECD, 1999)

Towards the other end of the innovation chain of events, firms must be able to access, digest and utilise the results of research efficiently and effectively. This requires the presence of staff trained to high levels of scientific and technical competence, who are able to locate new scientific ideas, recognise and convince senior managers of their potential and transform them into the products, processes and services demanded by tomorrow's markets. Again, the role of the science base (and of the government in supporting it) in educating and training such persons is crucial. Ongoing training is also essential, especially in view of the pace of scientific and technological change and thus a high degree of mobility of personnel between firms and other parts of the innovation system is highly desirable. International mobility of personnel is also essential. The contribution of any country to the stock of global knowledge can be but a fraction of the world's research output. Thus it is essential that global scientific advances are made accessible through a healthy and diverse science and engineering base whose members are welcomed as part of the international research community and who are able to understand and translate the outputs of external research[5].

The Commission's *Green Paper* led to extensive public debate which largely confirmed the broad diagnosis of the causes for Europe's "innovation deficit" made by the Commission. In response to this debate and in order to take forward the *Green Paper's* recommendations, in 1996 the Commission launched an *Action Plan for Innovation in Europe*[6]. The Action Plan identifies three broad areas for action:

- "to foster an innovation culture";
- "to establish a framework conducive to innovation"; and
- "to better articulate research and innovation."

Each of these broad areas encompasses a number of "Action Lines" for EU-wide innovation policy development. Subsequent development of these Action Lines through the course of the "Trend Chart" pilot study resulted in the categorisation shown below. The pilot study, which took forward work carried out under the Commission's European Innovation Monitoring System Programme (EIMS) involved a network of "innovation correspondents" – innovation policy experts in the EU Member States. These were responsible for the collection and

[5] House of Commons Science and Technology Select Committee *Engineering and Physical Sciences Based Innovation*, Session 1999-2000, Second Report, 31 January 2000.
http://www.publications.parliament.uk/pa/cm199900/cmselect/cmsctech/195/19504.htm
[6] COM(96) 589

analysis of information on new developments, at the national level, in innovation support policies and measures.

I. Fostering an Innovation Culture
I.1. Education and initial and further training
I.2. Mobility of students, research workers and teachers
I.3. Raising the awareness of the larger public and involving those concerned
I.4. Fostering innovative organisational and management practices in enterprises
I.5. Public authorities and support to innovation policy-makers
I.6. Promotion of clustering and co-operation for innovation
II. Establishing a Framework conducive to Innovation
II.1. Competition
II.2. Protection of intellectual and industrial property
II.3 Administrative simplification
II.4. Amelioration of legal and regulatory environments
II.5. Innovation financing
II.6. Taxation
III. Gearing Research to Innovation
III.1. Strategic vision of research and development
III.2. Strengthening research carried out by companies
III.3. Start-up of technology-based companies
III.4. Intensified co-operation between research, universities and companies
III.5. Strengthening the ability of companies, particularly SMEs, to absorb technologies and know-how

As is evidenced below, the attempt to deconstruct the process of innovation into a series of mutually exclusive sub-categories or processes can at best be partially successful. Thus, elements of particular Action Lines will exhibit overlaps with those of other Action Lines. Nevertheless, the categorisation does offer a relatively simple technique for studying innovation policy developments from a variety of perspectives.

Whilst the pilot study monitored developments in all Action Lines, the current Trend Chart project, which is further developing this monitoring and analytical work, also highlights developments in four "Focus Areas" of innovation policy. These areas reflect Commission priorities for the strengthening of innovation capabilities in the EU. Each focus area may be mapped onto specific Action Lines. The focus areas and their corresponding Action Line(s) are:

1. Intellectual Property Rights – Action Line II.2
2. Innovation Financing – Action Line II.5
3. Creation of New Technology Based Firms – Action Line III.3
4. Improving the link between research and innovation. – predominantly Action Line III.4 and also I.2

This report examines developments in innovation policy concerning the fourth Focus Area, that of "improving the link between research and innovation", an area which may be broadly described as "technology (and knowledge) transfer". In order to simplify a relatively large and complex area of innovation policy, the broad definition used here implies the "vertical"

shift of ideas from the science base (universities, research organisations, government laboratories, etc.) and their uptake by industry for incorporation into improved products, processes and services, rather than the "horizontal" transfer of knowledge between companies. Thus it does not deal with the phenomena of clustering or "technology valleys" (Action Line I.6) which have recently been the focus of significant policy attention.

The report covers innovation policy developments and innovation support measures put in place during the period November 1999 to June 2000. Information for this report has been taken from the Country Reports produced by the Trend Chart Network of Innovation Correspondents. The network covers the following countries: The EU Member States (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom), the EU Accession countries comprising ten Central and Eastern European states (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia) and Cyprus, Iceland, Israel, Liechtenstein and Norway.

Information about individual policy measures, collected via templates or datasheets, has also been examined.

2.2 Focus of the report

There are a number of ways in which policy makers may influence the uptake of research results by industry. Some are indirect, for example the modification of framework conditions such as legislation which allows greater interaction between public sector research institutes and businesses, or regulations for IPR handling. Others are more direct such as schemes which encourage joint R&D projects between staff in higher education institutes and those in companies, or the joint supervision of research students. Action Line III.5. - Strengthening the ability of companies, particularly SMEs, to absorb technologies and know-how – is also relevant but may extend beyond the firm/research institute framework. Similarly, measures supporting the transfer of knowledge between universities, for example, and industry, through the development of clusters, "technology valleys" and similar initiatives (Action Line I.6) deal more broadly with both the vertical and horizontal transfer of knowledge. Therefore, in order to simplify the analysis, this report focuses on those innovation policy developments which follow the more direct approach, namely those falling in Action Line III.4, and I.2:-

> **III.4 Intensified co-operation between research, universities and companies**: This Action Line includes actions which aim to promote the dissemination of knowledge between research institutions, universities and companies. This may cover the development of closer links between research and training (anticipating the needs of the productive sector); facilitating university company start-ups, legal and contractual arrangements between universities and public research organisations for the exploitation of results with industry; demonstrator projects; co-financing schemes and awards for academic/industrial research co-operation; stimulation of dialogue between the producers and users of technology (such as sectoral and inter-sectoral forums, technology clubs, etc.); creation and growth of science and technology parks, etc.
>
> **I.2 Mobility of students, research workers and teachers**: More specifically, this covers measures, schemes and actions dealing with the mobility of students, research workers, engineers or scientists from one country or

industrial sector to another, and from education or research to industry, which has the effect of encouraging the transfer of technology and the dissemination of know-how.

Action Line III.5. - Strengthening the ability of companies, particularly SMEs, to absorb technologies and know-how – is closely related to the ability to transfer technology and exploit or appropriate its benefits, but is not its primary purpose. In addition there are many sources of useful technologies to improve the performance of companies and the process of absorption is not always perceived as a technology transfer process.

3. Analysis of current policies

3.1 Introduction and overview

Table 1 gives an overview of the relative priorities of Action Lines in each country. Action Lines III.4 and I.2 are highlighted and are analysed in this report. It is clear that measures in support of intensified cooperation between research organisations, universities and industry (III.4) is in general given a higher priority within each country than the promotion of mobility of students, research workers, etc. (I.2).

Table 1: Overview of innovation priorities according to Action-Lines.

Priority areas and sub-areas	AT	BE	CY	DK	FI	FR	DE	GR	IS	IE	IL	IT	LI	LU	NL	NO	PT	ES	SE	UK
I. Fostering an Innovation Culture																				
I.1. Education and initial and further training	2	2		1	3	2	4	3		3		2		3	3	4	2	1	4	2
I.2. Mobility of students, research workers and teachers	2	2		3	2	3	2	2		1		3		2	1	1	2	2	3	3
I.3. Raising public awareness and involving those concerned	1	3		0	2	2	2	1		3		1		1	2	2	3	2	0	1
I.4. Innovation and management of enterprises	1	2		2	1	1	1	1		2		1		1	2	3	3	2	2	3
I.5. Public authorities	1	4		0	1	1	1	1		1		1		1	0	2	1	1	1	1
I.6. Promotion of clustering and co-operation for innovation	4	4		0	4	3	3	3		2		2		3	4	4	3	1	3	4
II. Establishing a Framework conducive to Innovation																				
II.1. Competition	3	1		4	3	1	1	2		2		2		2	1	1	1	1	2	1
II.2. Protection of intellectual and industrial property	2	1		0	2	1	1	2		2		2		2	2	1	2	1	3	1
II.3. Administrative simplification	1	3		4	2	2	2	1		1		5		2	2	2	3	1	2	1
II.4. Legal and regulatory environment	1	2		4	1	2	2	2		1		1		1	1	2	1	1	2	3
II.5. Financing of innovation	4	4		6	4	4	3	4		4		3		3	2	4	4	4	2	3
II.6. Taxation	2	1		0	1	2	4	1		3		1		2	2	2	2	4	1	2
III. Gearing Research to Innovation																				
III.1. Strategic vision of research and development	2	2		0	1	2	3	4		4		5		3	2	3	1	2	3	1
III.2. Strengthening research carried out by companies	4	2		0	4	2	1	4		4		3		4	5	2	3	4	1	2
III.3. Start-up of technology-based companies	3	3		5	3	4	3	3		2		2		4	3	2	3	4	3	4
III.4. Intensified co-operation between research, universities and companies	4	2		6	4	5	4	4		3		3		4	5	2	4	5	4	4
III.5. Strengthening the ability of SMEs to absorb technologies and know-how	3	2		5	2	3	3	2		2		3		2	3	3	2	4	4	4
Total points																				

3.2 Measures aimed at intensified co-operation between research bodies, universities and industry (Action Line III.4)

Several countries have prioritised policy measures concerning the transfer and valorisation of research results between the public and private sectors, as may be seen in **Error! Reference source not found.**. Whilst there is widespread recognition that the relationship between the various actors of the innovation system and the transfer of knowledge between them is extremely important to maintaining or improving national competitiveness, the specific measures introduced to achieve this goal vary according to existing national capabilities. Thus, for example, in countries such as Belgium, France, Ireland, the Netherlands, Sweden and the UK there is recognition that the country possesses a concentration of high quality research capacities and that economic development depends on the valorisation of the research efforts of this sector. Hence efforts in these countries generally aim at increasing the number and effectiveness of the paths by which research knowledge may be utilised in the innovation process. In Germany there are already a variety of channels available for transfer of technology and close cooperation between companies, research organisations and universities is often considered as a special strength of the Finnish system of innovation. However, in the former the existing system is considered slow and inefficient in transmitting knowledge, especially in the face of globalisation and short product cycles which require an increase in the speed of knowledge exploitation.

In other countries, it is recognised that both the basic research infrastructure requires strengthening and that interactions between research providers and industry need improving. Thus, recent Spanish measures aim at reinforcing cooperation between the various actors and at reducing obstacles to the formation of alliances and networks. Similarly Greece has introduced several measures aimed at strengthening the capacity of the national research system and also at supporting the diffusion of the results of this research. Portugal is in a similar position, being hampered by a tradition of a lack of cooperation between universities and industry. Italy has recently embarked on a process of restructuring its university research infrastructure, whilst legal provisions have been put in place to improve the interaction between public research institutes and industry. A similar legal readjustment has been implemented in France, where a strong public research base in government laboratories has hitherto been constrained from fully engaging with the private sector.

3.3 Measures aimed at the mobility of students, research workers and teachers (Action Line I.2)

Mobility schemes, which aim at the transfer of knowledge through the movement of personnel, through recruitment and secondment, enable host or recruiting organisations to benefit from the expertise of qualified, and in some cases, experienced, researchers. These are evident across a number of member states, with the principal emphasis on the mobility of university based researchers, mainly postgraduates, towards industry.

These can be of limited duration. The Austrian Impulse project (AT_19) supports employment of post-docs for a year; the FIRST schemes in Belgium (BE_37, BE_39) provide support for two years.

Other schemes are aimed more at improving recruitment, such as the Italian measures for the employment of university qualified researchers in industry (IT_02) and public research labs and SMEs (IT_08). Similarly, in Portugal a scheme was launched to encourage the Recruitment of postgraduates into industry (PT_02).

While companies may benefit from researchers' knowledge, the researcher can also gain valuable experience from working within a company, transferring and developing skills in an applied setting. The UK teaching company scheme (UK_18) is a good example of this and has operated with a high degree of success for a number of years.

The Norwegian SME competence scheme (NO_14) transfers more experienced research personnel from the higher education sector into project management and supervisory roles, to support the development of SMEs.

3.4 CEE Countries

The relative newness of the extension of the Trend Chart exercise to the countries of Central and Eastern Europe, combined with the distinctiveness of the national systems of innovation located within those countries, makes any direct comparison with the countries of Western Europe problematic. This is particularly the case for the Member States of the European Union, many of which have undergone several years of policy convergence, accelerated by the delivery of substantial structural fund support.

Thus, in central and Eastern Europe, with the exception of Latvia and Slovenia, there are no policy initiatives to encourage cooperation but there is an opportunity or need to improve cooperation (if it is believed that this will enhance innovation performance). In Poland there is some business support, without government subsidy or encouragement, for collaborative projects with individual researchers but not with institutions; this historical legacy might be the basis of a new model for supporting cooperation. Whilst it is difficult It might not be an optimum strategy for such countries to imitate the kinds of policies used in Western Europe.

3.5 A framework for further analysis

While the categorisation of measures illustrated in Table 1 provides a first order framework for the broad analysis of innovation support measures across the Member States and other countries, to examine the existence of trends in policy mechanisms requires that the perspective afforded by the action lines classification should be complemented by other perspectives on the nature of the measures recorded by the national correspondents. Some attention must be given to the nature of technology transfer as well as to the particular characteristics of the measures themselves, their design and modalities.

3.5.1 Technology Transfer

Technology transfer connotes a broad range of activities. The purpose and the definition of the term varies according to the situations in which it might take place (e.g. from one type of institution to another, from one sector to another, from idea to commercialisation, from public sector to private sector), and to the nature of what is actually being transferred. Technology can be embodied in equipment or can be knowledge, expertise or capability embodied in human experience and jobs, or in intellectual property packages. Technology transfer can be

regarded as a management process as well as a specific event or transaction and influencing that process might have coincidental benefits for the development of businesses and a region, for organisational learning and performance improvement as well as new product development. Thus the processes of developing R&D networks, learning networks and a culture conducive to the stimulation of new business activities can be improved even when specific technology transfer projects are commercially unsuccessful. All the vectors identified below might work in combination, even if a policy is aimed primarily at a single vector. The other elements might be adjusted to suit national priorities rather than to influence the effectiveness of technology transfer or the probability of its success. All of this is consistent with a focus on improving cooperation between universities, research institutes, and business.

3.5.2 2.4.2 Characteristics of Policy Mechanisms

The policy mechanisms employed to promote and facilitate technology transfer can be further analysed in terms of three principle sets of dimensions: modalities of knowledge transfer, structural support and targets. While these extend more generally to the full range of innovation measures, the intention here is to emphasise how technology transfer activities can be characterised in this three dimensional space. How each of these relate to the policy mechanisms surveyed are summarised in Table 2 below.

Knowledge Transfer concerns the modalities, the ways in which policy promotes the transfer of knowledge between organisations and individuals. From the measures examined, five main modalities can be identified:

- ***The Mobility of personnel***, namely programmes that encourage individuals to work, frequently on a temporary basis, within other organisations, bringing knowledge to their hosts and learning from them. There are numerous examples of the transfer of qualified personnel from University to industry, which include: the Austrian Impulse project (AT_19), which supports employment of post-docs for a year; the FIRST schemes in Belgium (BE_37, BE_39), Italian schemes for the employment of university qualified researchers in industry (IT_02) and public research labs and SMEs (IT_08); and the Recruitment of postgraduates in Portugal (PT_02). The UK Teaching Company Scheme (UK_18) illustrates the two way flow of knowledge promoted by such measures, with the fellow acting as a vector of knowledge flow. A few schemes also encourage the mobility of more experienced personnel, as in the case of the Norwegian SME competence scheme (NO_14) which transfers more experienced personnel into project management and supervisory roles.

- ***Transfer & exploitation of results***, involves more direct policy intervention to facilitate the wider diffusion and subsequent development of research results, supporting both those producing results and those seeking to take them further forward towards the market, such as through intermediary organisations. Examples of these are far more numerous and can further divided in terms of the various targets.

- ***Information diffusion*** modalities similarly make information more widely available, but on a more general level, such as making organisations aware not only of scientific and technological opportunities, but also of markets, support schemes and the like. In Germany the establishment of Technology Information Centres (DE_29) exemplifies this. This modality is frequently coupled with schemes for the transfer and exploitation of results, as in the case of the German InnoNet programme (DE_26),

aspects of the Spanish National Plan (ES-20), the Italian Scheme for the promotion of scientific culture (IT_03), and the UK Foresight Programme (UK_01).

- ***Demonstrator Projects*** are a powerful way in which research results, as embodied in particular technological applications (such as prototypes) are disseminated to potential adopters. This are often related to large R&D projects. Spain has a number of programmes of this type such as, the Concerted and Co-operative Industrial R&D scheme (ES_08), Cooperation Projects (ES_12) and large sectoral programmes in Food (ES_14) and Agro-Food (ES_15). Italy's Large research projects (IT-18) operates along similar lines in terms of also playing a demonstrator role.

- ***Networks & Clusters*** reflect the inter-organisational pathways used in the transfer of knowledge. These may involve well-established groupings of various types of organisations, with a set of common interests, with channels of communications between them. In Belgium, the Flemish government has a dedicated cluster programme (BE_24). In Germany, the Competence Network Medicine (DE_28) targets a sectoral cluster, although the subsequent Networks of Competence Programme (DE_36) is more general in scope. This modality may also require the establishment of new groupings or of new channels of communications. For example, the UK Foresight Programme aimed to stimulate debate and interaction between research actors and industry through a variety of channels, including expert panel discussions and reports, public debate, extensive documentation and a dedicated Website. In Austria the K ind/K net scheme (AT_27) is a key national innovation measure, which *inter alia* aims to stimulate the emergence of industrial clusters.

Structural Support modalities refer to the ways in which policy can influence the institutional structure for innovative activities in general, and in particular, promote the transfer and diffusion of knowledge. The significance of this dimension is reflected in the fact that the action plan categorisation does enable cross-classification of such measures under other action lines.

- ***R&D funds*** are more concerned with the generation of new knowledge, than its subsequent transfer, although, clearly the transfer of knowledge occurs throughout the R&D process.
- ***The Legal framework*** governs the whole R&D process, and particularly affects the technology transfer process with regard to intellectual property considerations (which are dealt with in greater detail in a separate thematic report). There is considerable overlap with measures classified under action lines II.2 and II.4
- ***Tax & Financial Incentives*** likewise impinge more generally on the innovation process. Action lines II.5 and II.6 are also directly concerned with these measures. The Swedish Seed Programme (SE_02) is a financial support scheme, providing high-risk loans to innovative SMEs.
- ***Coordination and Transparency*** modalities relate to government's formulation and implementation of all innovation related policy measures, how relations between them are exploited to improve efficiency and effectiveness, as well as their clarity.
- ***Infrastructural Development*** includes the establishment of dedicated intermediary organisations to facilitate technology transfer also complement the other structural modalities (such as the Spanish scheme to fund non-profit technology transfer offices (ES_10),

The Targets of policy mechanisms are the organisational types and levels at which policy mechanisms are aimed. These range from individual researchers, through research groups and institutions, to large groupings of organisations, such as sectors and regions. More specifically, the main categories of targets are:

- ***Researchers/young scientists***, such as through many of the specific mobility and training schemes listed above.
- ***Universities and Research institutes***, seen as playing key roles on the generation of new knowledge and training of researchers, as well as seen as the source of spin-off companies. For examples the Flanders University Interfaces (BE_18), the Walloon FIRST Spin-off programme (BE_37), the German EXIST (DE_21), the Finnish SPINNO (FI_1) and the Swedish Competence Centre (SE_04) schemes are among measures designed to encourage such spin-offs. The creation of new institutes or centres of excellence, such as the Dutch Technological Top Institutes (NL_19) concentrate knowledge into a single location accessible by all other types of organisation.
- ***SMEs***, prioritised in many countries, typically characterised as in need of support for their innovative activities, both in diffusing and absorbing new knowledge. SMEs are targeted as beneficiaries of structural support measures, such as the Norwegian TEFT programme (NO_14), which improves the technological competence of SMEs, through a system of technological attachés. Mobility programmes, such as the Italian research assignments scheme (IT_08), also target SMEs.
- ***Large Companies,*** seen to reflect industry in general, with R&D capabilities and often playing key roles in particular sectors.
- ***Sectors***, particularly those closely identifiable with specific technological priorities, as well as embracing a range of organisation types, working on different aspects of common technological themes. The UK Biotechnology Exploitation Platform Challenge (UK_37) aims at transferring knowledge through stimulating the creation of clusters in bioscience research. The Spanish National Food (ES_14) and AgroFood (ES_15) Programmes are sectorally targeted demonstrator programmes.
- ***Regions***, which are targeted as in need of more general support, or reflect administrative and policy-making structures. For example, most of the Belgian examples already cited are actually regional in administrative character.

Table 2 provides a brief Summary of the situation in each country. It is based on the evidence and interpretations presented in Country Reports. More information about the policy measures relevant to each situation can be gleaned from Table 3 in Annex 1. This has been prepared from individual template/datasheet information.

4. Conclusions

Over recent years, there has been increasing recognition amongst both academics and policy makers that the process of innovation can no longer be adequately described by the use of linear models. The Commission's Green Paper on Innovation elegantly documents the major factors underlying the requirements for a successful innovation policy and attempts to deconstruct these requirements into elements which might form the basis for complementary sets of innovation promotion measures. Acting in combination, these measures should provide an optimal environment for innovation to flourish.

However, within the complex of feedback loops, fiscal incentives, financing requirements, intellectual property concerns and other features of the "innovation environment", the attractively simplistic view of innovation remains and the linkage between the primary producers of knowledge and technology and the "downstream" users who transform this knowledge into innovative products, processes and services is still recognised as one of the major factors within the process of innovation. Thus, within national (and regional) innovation policies across (and outside) the EU, numerous measures, schemes, mechanisms and programmes have been put in place, all aiming, albeit with some subtle differences and distinctions, to improve the interaction, and hence the flow of research results, across the interface between what may be termed the science base on one hand and industry on the other.

The ways in which this interaction may be promoted vary between countries. This results, to a large extent, from the diversity of innovation systems present across Europe. For example, in those countries where the outputs of the science base have proved inappropriate to the needs of industry, efforts have been made to improve the industrial applicability of the results of research, often through strengthening the science base infrastructure or through re-directing the research effort. In other countries a longstanding "tradition" of non-interaction between the science base (especially universities) and firms has had to be overcome. Legal barriers preventing the uptake of research results from the public sector by industry have also had to be dismantled.

In still other cases, measures have been introduced which attempt to improve the transfer of research results from a relatively strong science base. A number of countries have increased the number of schemes in existence, extending the range of modalities through which these operate (personnel mobility, transfer of results, information diffusion, demonstrator projects, clusters and networks), or the structural means they employ (R&D funds, legal framework, tax/financial incentives, etc.) or the targets they impact (students, universities/institutes, SMEs, large companies, sectors, regions). Further distinctions have also been introduced, such as the introduction of measures in specific technological fields, particularly ICTs and biotechnology. Other countries have attempted to induce greater dialogue through various incentive schemes (often largely financial based). Many schemes concentrate on promoting the movement of personnel between the public and privates sectors – some are bilateral and enhance the transfer of tacit knowledge or research skills, others are more unilateral and focus on training and the improvement of research capabilities within the industrial sector.

In each case, however, the types of scheme introduced have been generally formulated according to the perceived national policy context. This diversity of approaches does not facilitate the identification of specific trends other than those broadly outlined above. In

addition, the schemes may be combined with measures that impact on other Action Lines. Thus, issues such as education and training, IPR, legislative frameworks, clustering and cooperation, start-ups – to name several, may all feature as subsidiary effects within the schemes dealt with in this report. Indeed the modalities, structures and targets mentioned above all find resonance within the various Action Lines set out under the *Green Paper on Innovation*. Moreover, it is important to recognise that the strengthening of cooperation and interaction between the providers of research on the one hand, and industry on the other, is frequently the result of the implementation of a combination of measures.

To encapsulate the results from this first analysis of measures defined under the Trend Chart it is clear that the basic policy question that has been posed in all these instances is "what are the barriers to the uptake, by industry, of research results produced in the public domain?". In answering this question, policy makers appear to have identified two major sets of conditions:

In the first set, the results of research (produced by the science base) appear to be unattractive to industry. In response, policy makers have adopted two main courses of action as appropriate:

1. Attempts to improve the overall research capacity of the science base, and
2. Attempts to re-direct the research efforts of the science base to the needs of industry

In the second set, despite the presence of a capable science base, the results of its research are failing to be taken up by industry. Here, two broad types of policy response may be seen:

1. Efforts to improve awareness within industry of research results from the science base;
2. Provision of incentives for interaction between the two sets of actors. These may be further subdivided into:
    a. efforts aimed at effecting transfer through cooperative research projects; and
    b. efforts aimed at effecting transfer through personnel mobility.

Overall, it can be seen that an emphasis on the transfer of knowledge and technology from the science base (comprising universities, research institutes, public laboratories, etc.) to industry is firmly accepted and established in the innovation policies of western European countries. However it is less obvious if there is a definite trend within the range of technology transfer policy actions, or what that trend might be – specific circumstances engender appropriate responses. Thus, it is more likely that the western European nations are more likely to benefit from the transfer of aspects and operational nuances from the schemes of other similar nations rather than the wholesale adoption of complete schemes. With regard to the countries of Central and Eastern Europe, it is possible that suitable opportunities for transfer and modification may be found in schemes which involve infrastructural support or restructuring of the science base, or which endeavour to heighten awareness within the industrial sector. The learning process need not be one-way - however, based on the presently available information it is not possible to identify complementary examples for transfer or adoption within the EU and Associate States.

ANNEXES

5.1. Modes and Targets of individual policy measures

			Modes						Targets							
Country	*Instruments*	*Date*	Mobility of personnel	Transfer & exploitation of results	Information diffusion	Demonstrator projects	Networks & clusters		Regions	Young scientists	Universities	SMEs.	Research Institutes	Sectors & Large Companies	
Austria	AT_19 FWF Impulse Projects (1997-2000)	1997	✓							✓		✓			
Austria	AT_20 Relay Projects Science-Industry (1995-2000)	1995		✓							✓		✓		
Austria	AT_22 Impuls Polytechnics-Industry (1997-2003)	1997		✓							✓				
Austria	Kplus programme (AT_23)	1997		✓							✓	✓	✓		
Austria	**TechGate Vienna (AT_24)**	1999		✓								✓	✓		
Austria	**Kind/K net (AT_27)**	1999		✓			✓								
Austria			1	5			1	7		1	3	3	3		10
Belgium	BE_18 (Vl) University Interfaces (1998-2001)	1998		✓							✓				Also refers to Spin-off companies?
Belgium	BE_20 (Vl) Equipment for Research on Materials (1998-2001)	1997				????					✓	✓	✓	✓	
Belgium	BE_24 (Vl) Clusters (1997-)	???		✓	✓		✓					✓	✓		
Belgium	BE_27 (Vl) Incubators & Innovation Centres (1994-)	1997		✓								✓	✓		
Belgium	BE_36 (Wa) FIRST (1991-)	1989 univ, 1991 HEI	✓	✓							✓				
Belgium	BE_37 (Wa) FIRST - Spin-off (1999-)		✓	✓							✓				
Belgium	BE_39 (Wa) FIRST-Europe (1999-)	1999.	✓	✓							✓	✓			
Belgium	BE_40 (Wa) (Feasibility studies for technical support (1990-)	1990		✓								✓			
Belgium	BE_43 (Wa) Technological guidance (1995-)	1995		✓								✓			
Belgium	BE_47 (Wa) University Interfaces (1999-2002)	1999		✓								✓			
Belgium			3	9	1		1	14			5	7	3		15
Germany	DE_21 EXIST – start-ups from colleges	1998	✓	✓					✓	✓			✓	✓	

	and universities (1998-2001)														
Germany	DE_25 Lead Projects (1996-2006)	1996		✓							✓	✓	✓		
Germany	DE_26 InnoNet (? -)	1999	✓	✓	✓		✓					✓	✓		
Germany	DE_27 Competence Network Medicine (1999-)	1997		✓			✓		✓		✓	✓	✓		
Germany	DE_29 Technology Information Centres (? –)	???			✓										
Germany	**DE_36 Networks of Competence (2000-)**	2000					✓			✓					
Germany	DE_41 Compound Research (? -)	???		✓									✓		
Germany	DE_43 Technology Alliance (1994-)	1994	✓	✓			✓						✓		
Germany	**DE_51 LEARNET: network based learning in SMEs (2000-)**	2000		✓	✓		✓					✓			
Germany	DE_52 BioProfile (1999-2007)	1999		✓	✓		✓		✓			✓	✓	✓	
Germany			4	8	4		6	22	3	2	2	5	6	2	20
Spain	ES_01 CDTI Financial support (1978-)	1978		✓								✓		✓	
Spain	ES_06 ATYCA Initiative (1997-1999)	1997		✓					✓		✓	✓	✓	✓	
Spain	ES_07 PETRI Programme (1995-)	1995		✓								✓			
Spain	ES_08 Concerted and cooperative industrial R&D projects (1994)	1994		✓		✓					✓	✓		✓	
Spain	ES_09 FEDER - Fostering R&D and Innovation in Objective 1 and 2 Regions (1997-1999)	1997		✓							✓	✓			
Spain	ES_10 Financial support of non-profit Technology Transfer Offices (1996-)	1996		✓							✓		✓		
Spain	**ES_12 Cooperation projects – P4 Modality (2000-2003)**	2000		✓		✓					✓	✓	✓		
Spain	**ES_13 R&D projects National Programmes (2000-2003)**	2000		✓								✓		✓	
Spain	**ES_14 National Food Programme (2000-2003)**	2000		✓		✓					✓	✓	✓	✓	
Spain	**ES_15 National Programme of AgroFood Resources and Technologies (2000-2003)**	2000		✓		✓							✓	✓	
Spain	**ES_16 National Programme of Environment: R&D and Innovation Projects (2000-2003)**	2000		✓							✓	✓	✓	✓	
Spain	**ES_17 PROFIT: Programme to encourage technological research (2000-2003)**	2000	✓	✓	✓							✓	✓	✓	
Spain	**ES_19 INFO XXI: The Information Society for all (2000-)**	2000		✓		✓			✓	✓					
Spain	**ES_20 Special Actions of National Programmes (2000-2003)**	2000		✓	✓						✓		✓	✓	
Spain			4	14	2	5		25	2	2	8	10	8	9	39
Finland	FI_1 SPINNO (1990-)	1990	✓	✓	✓					✓					
Finland	FI_5 Centre of expertise programme (1994-2006)	1994		✓		✓			✓		✓	✓		✓	
Finland	FI_10 Technology transfer from universities and research organisations (1999-2001)	1999		✓	✓				✓		✓				
Finland			1	3	2	1		7	2	1	2	1		1	7
France	FR_12 Creation of Incubator structures (1999-)	1999		✓			✓				✓		✓		
France	FR_17 Technological Research and Innovation Networks (1998-)	1998		✓			✓						✓		

France	FR_27 FRATT (?-?)														
France	**FR_28 National Centres for Technological Research (2000-)**	2000													
France				2			2	4			1		2		3
Greece	GR_16 EKVAN (1997-2000)														
Greece	GR_17 Development of microelectronics technology and micromechanics (1998-)														
Greece	GR_19 Research and innovation in Agricultural Biotechnology (1998-)														
Greece	GR_26 AXIA – Exploitation of successful projects of STRIDE and EPET 1 (?-?)														
Greece															
Ireland	IE_22 Technology Centres (1989-)														
Ireland	IE_23 Graduate Enterprise Programme (1995-)														
Ireland	IE_24 Campus Companies Programme (1996-)														
Ireland															
Italy	IT_01 Special applied research fund (1997-)	1997		✓		✓						✓	✓	✓	
Italy	IT_02 Employment in the field of research (1997-)	1997	✓	✓								✓		✓	
Italy	IT_03 Support for the promotion of scientific culture (1997-)	1997		✓	✓								✓		
Italy	IT_04 Autonomous research projects in the regions lagging behind (1995-)	1995		✓		✓						✓		✓	
Italy	IT_05 Research centres in the regions lagging behind (1995-)	1995		✓								✓		✓	
Italy	IT_07 Measures aimed at sustaining innovation (1997-)	1997		✓								✓		✓	
Italy	IT_08 Research assignments to public research laboratories and SMEs (1998-)	1998	✓									✓			
Italy	IT_11 Reorganisation of Fund for Research Support (1999-)	1999	✓									✓	✓	✓	
Italy	IT_15 Reorganisation and establishment of public research centres (1999)	1999	✓						✓						
Italy	IT_18 Large research projects (1988-)	1998				✓			✓		✓		✓	✓	
Italy	IT_23 Reordering of promotion bodies and establishment of Sviluppo Itlalia (1999)	???		✓											
Italy	**IT_25 CSF Objective 1 2000-2006/PIA (2000-2006)**	2000		✓								✓		✓	
Italy	**IT_26 Agreement Sviluppo Italia – MURST (2000 -)**	2000		✓						✓	✓		✓		
Italy	IT_32 MURST Directive 1310 (1999-)	1999		✓								✓			
Italy	IT_33 MURST Directive 760 (1999-)	1999		✓					✓		✓	✓		✓	
Italy			4	11	1	3		19	3	1	3	10	5	9	31
Netherlands	NL_01 Business-oriented Technological Cooperation Projects (1997-)	1997		✓								✓	✓	✓	
Netherlands	NL_07 BIT Industry oriented International Technology Cooperation (1997-)	1997		✓		✓								✓	
Netherlands	NL_13 EET (Economy, Ecology and Technology) programme (1997-)	1997		✓										✓	
Netherlands	NL_14 SMO Subsidies Maritime Research (1997-)	1997		✓										✓	
Netherlands	NL_18 IOP Innovation Oriented Research Programme (1998-)	1998		✓							✓		✓		
Netherlands	NL_19 Technological Top Institutes (1998-2006)	1998		✓							✓	✓	✓	✓	
Netherlands	NL_29 ICES/KIS (1998-)	1998		✓					✓			✓	✓	✓	
Netherlands	NL_31 Technology Foundation STW (1981-)	1981		✓							✓		✓	✓	
Netherlands				8		1		9	1		3	3	5	7	19

Norway	NO_10 BRIDGE Programme (1994-) (* modified 1998 – covers programmes below)	???		✓			✓					✓				
Norway	NO_11 FORNY II – research based innovation & establishment (1999-2004)	1994		✓						✓	✓		✓			
Norway	NO_12 TEFT – tech. transfer from technological research institutes to SMEs (1994-2003)	1999		✓								✓	✓			
Norway	NO_14 SME Competence (1994-2003)	1997	✓	✓						✓	✓	✓				
Norway	NO_23 SME Colleges (1994-2003)	1999		✓												
Norway			1	5			1	7		2	2	3	2		9	
Portugal	PT _01 R&D activities by consortia (1994-1999)	1994		✓			✓					✓	✓	✓		
Portugal	PT_02 Recruitment of Doctorates and Masters (1994-1999)	1996	✓									✓		✓		
Portugal	PT_07 Development of Technological Capabilities at enterprise level (1997-1999)	1997		✓								✓				
Portugal	PT_09 Financial incentives to R&D industrial projects (1994-1999)	1994		✓							✓	✓	✓	✓		
Portugal	PT_10 Innovation and Technological Transfer measure (1994-1999)	1995		✓		✓					✓	✓		✓		
Portugal			1	4		1	1	7				4	1	4	9	
Sweden	SE_01 SNITS (Small and New companies' development of innovations and technology transfer support) (1994-pending evaluation)	1994		✓								✓				
Sweden	SE_02 Seed Finance (1980s-)	???		✓								✓				
Sweden	SE_04 Competence Centre Programme (1995-2006)	1995		✓							✓			✓		
Sweden	SE_06 Regional Technology Programme (1995-2000)	1995		✓								✓				
Sweden	SE_07 New Graduate Schools (1996-)	1993		✓					✓	✓	✓					
Sweden	SE_09 New liaison functions (1997-2002)	1997		✓			✓					✓				
Sweden	SE_11 Active Industrial Cooperation (?-?)															
Sweden				6			1	7	1	1	2	4		1	9	
United Kingdom	UK_01 Foresight Programme (1993-2001)	1993		✓	✓		✓					✓	✓	✓		
United Kingdom	UK_18 Teaching Company Scheme (1987-) (funding doubled in 2000)	???	✓								✓	✓				
United Kingdom	UK_19 Faraday Partnerships (1999-2000)	1999	✓			✓					✓		✓			
United Kingdom	UK_20 Foresight LINK (1995-)	1995		✓		✓			✓		✓		✓			
United Kingdom	UK_21 Science Enterprise Challenge (1999-2001)	1999		✓			✓				✓					
United Kingdom	UK_22 Higher Education Reach-Out to Business and the Community (1998-2003)	1998		✓								✓		✓		
United Kingdom	UK_23 University for Industry (1999-)	1999		✓								✓				
United Kingdom	UK_29 Joint Research Equipment Initiative (1996-)	1996									✓	✓				
United Kingdom	**UK_34 Regional Competitiveness Development Fund (2000-)**	2000		✓			✓									
United Kingdom	UK_37 Biotechnology Exploitation Platform Challenge (1999-)	1999		✓			✓				✓		✓	✓		
United Kingdom			2	7	1	2	4	16	1		6	5	4	3	19	
TOTAL			**21**	**82**	**11**	**13**	**17**	**144**	**13**	**10**	**37**	**55**	**39**	**36**	**190**	

Country	*Instruments*	*Date*	Mobility of personnel	Transfer & exploitation of results	Information diffusion	Demonstrator projects	Networks & clusters		Regions	Young scientists	Universities	SMEs.	Research Institutes	Sectors & Large Companies	
Austria			1	5			1	7		1	3	3	3		10
Belgium			3	9	1		1	14			5	7	3		15
Germany			4	8	4		6	22	3	2	2	5	6	2	20
Spain			4	14	2	5		25	2	2	8	10	8	9	39
Finland			1	3	2	1		7	2	1	2	1		1	7
France				2			2	4			1		2		3
Greece															
Ireland															
Italy			4	11	1	3		19	3	1	3	10	5	9	31
Netherlands				8		1		9	1		3	3	5	7	19
Norway			1	5			1	7		2	2	3	2		9
Portugal			1	4		1	1	7				4	1	4	9
Sweden				6			1	7	1	1	2	4		1	9
United Kingdom			2	7	1	2	4	16	1		6	5	4	3	19
TOTAL			**21**	**82**	**11**	**13**	**17**	**144**	**13**	**10**	**37**	**55**	**39**	**36**	**190**
Ranking – frequency Occurrence			**2**	**1**	**5**	**4**	**3**		**5**	**6**	**3**	**1**	**2**	**4**	

5.2. Table of Technology Transfer Measures

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Austria	AT_19 FWF Impulse Projects (1997-2000)	www.fwf.ac.at/foerderung/indkoop-en.html	1997	Impulse projects are designed to improve the transfer of knowledge between Austrian universities and industry as well as to stimulate R&D in the business sector. The Federal Ministry of Science and Transport (BMWV) bears the cost of employing a Post-Doc scientist for at least a year. An additional goal is to help young scientists to get in touch with corporate R&D.	Mobility of personnel	Young scientists SMEs.
Austria	AT_20 Relay Projects Science-Industry (1995-2000)	www.fwf.ac.at/foerderung/indkoop-en.html	1995	Contact projects are designed to bridge the gap between science and industry. Companies interested in a certain scientific project supported by the FWF can receive updates about the progress, call on the expertise of the project co-ordinator and obtain the right of pre-emption for the project results.	Transfer & exploitation of results	Research Institutes Universities
Austria	AT_22 Impuls Polytechnics-Industry (1997-2003)		1997	The programme finances joint projects between enterprises and the recently established polytechnics (Fachhochschulen). The aim is to initiate or strengthen co-operation between polytechnics and enterprises and to promote the build-up of a research infrastructure at the polytechnics	Transfer & exploitation of results	Polytechnics and enterprises
Austria	Kplus programme (AT_23)	www.bmwv.gv.at/en/rdt/kpluse.htm	1997	The Kplus programme intends to establish 12 – 15 joint-research centres ("centres of competence") which consist of university institutes and enterprise. The centres will perform industry-related research on a precompetitive stage. Projects are limited in time and are expected to exist for at least seven years. The financial contribution of the public will account up to 60% of the budget. One important feature of the programme is the multi-enterprise approach, a second feature which distinct k plus from the kind and the k net programmes (AT 27) its orientation towards science-industry co-operation. The programme is regarded as one of the key measures of the Austrian innovation and technology policy.	Transfer & exploitation of results	Enterprises, universities and research institutions
Austria	**TechGate Vienna (AT_24)**	www.magwien.gv.at:80/ma18/02/19/01.htm	1999	TechGate Vienna is a planned science and technology park, which aims at stimulating the technological potential of Vienna. The major objectives are to raise the technology standard of Viennese enterprises and the creation of employment in hi-tech industries.	Transfer & exploitation of results	Technology-orientated industrial enterprises research institutions
Austria	**Kind/K net (AT_27)**	www.bmwa.gv.at	1999	The programme is regarded as one of the key measures of the Austrian innovation and technology policy. Kind aims at initiating centres of competence (institutions with a focus on technology and research jointly run by enterprises and universities) and stimulating the emergence of industrial clusters. The starting point on k ind is existing technological strengths of industries and regions. The purpose of k net is to establish networks ("virtual centres of competence") between research institutions and companies on a regional and national level. Both measures aim at fostering existing technological strengths and promoting the diffusion of cluster-related knowledge	Transfer & exploitation of results Networks & clusters	SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Belgium	BE_18 (Vl) University Interfaces (1998-2001)	www.iwt.be	1998	The Flemish government supports the interface activities of the universities, for the following activities: -Stimulation of co-operation between university and industry - Promotion of the creation of spin-off companies - Valorisation of research results in industry - Dealing with IPR in universities. The Flemish government devotes a yearly budget of 50 Mio BF for this support.	Transfer & exploitation of results Spin-off companies???	Universities
Belgium	BE_20 (Vl) Equipment for Research on Materials (1998-2001)	www.iwt.be/newmat/newmatdefault.htm	1997	Provision of 100% funding for large scientific equipment	????	Large Industrial Companies Research Institutes SMEs Universities
Belgium	BE_24 (Vl) Clusters (1997-)	www.iwt.be	???	The Flemish government supports clusters, defined as networks of enterprises that develop co-operation practices and/or collaborate with research organisations in one or several areas: R&D, development of products, training, etc.	Transfer & exploitation of results Information diffusion Networks & clusters	Enterprises Research centres
Belgium	BE_27 (Vl) Incubators & Innovation Centres (1994-)		1997	The Flemish government supports the establishment of innovation centres and incubators, located in research and scientific parks or in an university campus. These centres are specialised types of enterprise centres, where researchers can develop a product as a result of research results, and where enterprises with an important need for applied scientific research can receive guidance. The main aim of these centres is thus to ease the creation of spin-off companies.	Transfer & exploitation of results	Enterprises Research centres
Belgium	BE_36 (Wa) FIRST (1991-)		1989 for univ, 1991 for HEI	FIRST-University and HEI is one among the 5 FIRST schemes that aim at stimulating Technological and Scientific Research and developing collaboration between the academic and industrial research worlds. Its aim is to reinforce technological and scientific potential of Walloon universities and HEI and to valorise this potential in Walloon enterprises.	Mobility of personnel Transfer & exploitation of results	universities and HEI
Belgium	BE_37 (Wa) FIRST - Spin-off (1999-)			FIRST-Spin-off aim is to stimulate the creation of spin-off enterprises by university researchers.	Mobility of personnel Transfer & exploitation of results	universities and HEI
Belgium	BE_39 (Wa) FIRST-Europe (1999-)		1999.	FIRST-Europe scheme finances the salary of a university researcher during two years + costs for the research institution + travel and accommodation costs, for a research project carried out in collaboration with an industrial partner and a research organisation in EU.	Mobility of personnel Transfer & exploitation of results	universities, enterprises
Belgium	BE_40 (Wa) (Feasibility studies for technical support (1990-)		1990	The feasibility study scheme supports the financing of technical services (analyses and measures, testing and measurement, patenting possibilities,") with an exploratory character, in view of testing hypotheses before the elaboration of a formal R&D project.	Transfer & exploitation of results	SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Belgium	BE_43 (Wa) Technological guidance (1995-)		1995	Technology Advice services are attached to almost all collective research centres in Belgium. The collective research centres are sectorial research organisations where research is carried out for the whole of enterprises in these sectors. The role of Technology advisers is to act as a link between these centres and the enterprise world. They are at the disposal of enterprises, and especially SMEs, to diffuse the results of research undertaken in collective research centres to enterprises and help them find solutions to their technical problems.	Transfer & exploitation of results	SMEs
Belgium	BE_47 (Wa) University Interfaces (1999-2002)		1999	This measure has been taken in order to stimulate the exploitation of research results by universities.	Transfer & exploitation of results	SMEs
Germany	DE_21 EXIST – start-ups from colleges and universities (1998-2001)	www.bmbf.de	1998	In 1997 the BMBF introduced a competition called EXIST which was aimed, above all, at the high proportion of students. This contest pointed out concepts as to how students, others involved at universities and graduates could become interested, trained and subsidised in starting up an enterprise, and accompanied into self-employment. The program is made to improve the conditions for the foundation of new businesses and by that means increase the number of start-ups originating in academic institutions. They aim at the creation of public private partnerships between higher education and economy.	Transfer & exploitation of results Mobility of personnel	Large Companies/Large Industrial Companies Research Institutes Researchers
Germany	DE_25 Lead Projects (1996-2006)	www.bmbf.de	1996	The Leitprojekte" is aimed at pooling competence in research and development as a basis for marketable products, processes and services. It directs the research process towards the innovation goal and to create a network of researchers, developers and users. The BMBF stages public ideas contests for "Leitprojekte". The participants set their own tasks in the framework of well-defined subject areas. Eligible for participation in this contest are consortia of industrial enterprises, scientific institutions and public sector institutions that can submit a verifiable and feasible concept for co-operation and the commercialisation of innovative ideas. The BMBF provides funding for further specification of the winning concepts and for their subsequent implementation.	Transfer & exploitation of results	Research Institutes SMEs/Industrial SMEs Universities
Germany	DE_26 InnoNet (? -)	www.vdivde-it.de/innonet	1999	The "InnoNet" Innovation Programme is supposed to improve co-operation between small & medium sized companies and research establishments from as early as the R&D phase and initiate a comprehensive collaboration of research establishments. In the "InnoNet" programme, ambitious combined projects providing the basis for the development of innovative products, processes and services are supported. In the framework of these projects, at least four small or medium-sized enterprises with at least two research establishments (i.e. universities incl. technical colleges, non-university research establishments, Federal Institutes, as well as external non-profit-making organisations of industrial research in the new Länder).	Transfer & exploitation of results Information diffusion Networks & clusters Mobility of personnel	Research Institutes SMEs/Industrial SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Germany	DE_27 Competence Network Medicine (1999-)	www.dlr.de/PT/GF/Kompetenznetze-medizin	1997	The announcement of the competence network competition is to assist and promote the utilisation of available potential of scientific innovations in research establishments for solving practical, clinical problems. For this research it is necessary for the basic researchers to shed some light on the causes of illness, closely collaborating with those who develop new therapies and with the doctors who test the success of these therapies under surgery conditions. In 1997 a competition was announced for formulating concepts for networks which both should provide a horizontal networking (development of new solutions through co-operation of research organisations) and a vertical networking (building bridges between research and medical services at hospitals).	Transfer & exploitation of results Networks & clusters	Large Companies/ Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs Universities
Germany	DE_29 Technology Information Centres (? –)	www.forschung.bmbf.de/index_d.htm	???	The program is made to allow those who search for information to have quick access to various databases on literary references, facts and especially on specific research programs, supportive measures, research projects, research results as well as technology-transfer-centres and innovation-centres. By offering these information, the applicants and the recipients of research subsidies are to be brought to state-of-the-art-science and technology.	Information diffusion	
Germany	**DE_36 Networks of Competence (2000-)**	www.vdi.de/tz-pt/tz-pt.htm	2000	The Federal Ministry of Education and Research has developed the online platform, kompetenznetze.de, in order to increase co-operation between those with high degrees of competence in science, education and economy. Kompetenznetze.de provides those seeking co-operative partners a guide to innovation, investment and education.	Networks & clusters	Researchers
Germany	DE_41 Compound Research (? -)	www.fz-juelich.de	???	The Compound Research project assists in the construction, operation and optimal use of large scientific devices through the co-operation of scientists and researchers from German universities and university-independent research institutes with the large scientific devices of national and international research centres. The initiative focuses on the following factors: transinstitutional, transregional, interdisciplinary, international co-operation	Transfer & exploitation of results	Research institutes
Germany	DE_43 Technology Alliance (1994-)	www.technologieallianz.de www.patente.bmbf.de/foerde/patentstelle/seite5.htm	1994	The Technology Alliance is a union of research institutions and professional technology agents that currently consists of ten members. Using a network, the technology suppliers and users are brought together. The grouping of human resources of the members forces and accelerates the Know-how-Transfer between research and industry.	Transfer & exploitation of results Networks & clusters Mobility of personnel	Research Institutes
Germany	**DE_51 LEARNET: network based learning in SMEs (2000-)**	www.dlr.de	2000	A contest initiated by the BMWi aims to bring together basic knowledge in various field of training (ranging from computer science to cognitive science to pedagogical science) in order to create innovative solutions for a network-based education system. On the side of the suppliers of such technologies, BMWi intends to support SMEs offering training services and software. On the side of the users of such education systems, both SMEs and public administration are target groups. The"content to context" system includes: Synergies between information technology, education methods and organisational structures for developing enterprises and public administration. support for self-directed learning for qualified employees, quality assurance for multimedia learning tools.	Transfer & exploitation of results Information diffusion Networks	SMEs/Industrial SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Germany	DE_52 BioProfile (1999-2007)	www.fz-juelich.de/beo/beo.htm	1999	The BioProfile programme has the following goals: To develop a specific biotechnological profile in three selected regions of Germany Support innovation and commercialisation of specialised biotechnological knowledge both in the field of new products and services, and new processes. BioProfile uses the experiences made in the BioRegio programme but has a stronger focus on more specialised biotechnological knowledge base in specific fields of biotechnology, especially in fields outside the health application (such as plant biotechnology). Regions will be selected via a contest.	Transfer & exploitation of results Information diffusion Networks & clusters	Large Companies/Large Industrial Companies Research Institutes SMEs/Industrial SMEs within selected Regions
Spain	ES_01 CDTI Financial support (1978-)	www.cdti.es	1978	CDTI offers support services for the development of business R&D projects, exploiting technologies developed by the company at the international level, and offering technological-industrial supplies to national and international scientific and technological organisations. CDTI grants companies its own financial aid –and eases access to third parties– for research and development projects both at the national and international level. CDTI also gives support to companies for exploiting, at an international level, technologies developed by them.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Spain	ES_06 ATYCA Initiative (1997-1999)	www.min.es	1997	ATYCA gathers the previews industrial measures to finance R&D projects. The annual budget for this measure is >10.000 Keuro and contributes financially to the project with a rate of the eligible costs, while the firms must support the activities with dedicated resources: financial, equipment or personal. The measure provides funds only during 1 year. The grants are directed to industrial firms to finance the following types of activity: a) Promotion of Industrial Technology programme, b) Industrial Safety and Quality programme, c) Energy R&D programme.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs,Universities
Spain	ES_07 PETRI Programme (1995-)	www.seui.mec.es	1995	PETRI Programme is a financial instrument of the National Programme for the Promotion of the Science-Technology-Industry System Articulation (PACTI). The annual budget is higher than 500 K euro and the impact of this approach is expected in the mid and long run. The main goal of PETRI Programme is to encourage the transfer of technologies and scientific results with industrial application generated in universities, public research organisms and technological centres to companies. This action is implemented through the development of a pre-competitive project aimed at the adaptation of the original technologies or research results to the needs of the company.	Transfer & exploitation of results	SMEs/Industrial SMEs
Spain	ES_08 Concerted and cooperative industrial R&D projects (1994)	www.seui.mec.es www.cdti.es	1994	Funding is provided directly to companies to develop an R&D project with a Public Research Centre. The main goals are to promote co-operation between University and Industry and to encourage the implementation of joint research projects and technology transfer between companies, universities and Innovation and Innovation and Technology Centre. Concerted projects are to promote collaboration among companies and universities or Public research centres and co-operative projects are to promote collaboration among companies and Innovation and Technology centres.	Transfer & exploitation of results Demonstrator projects	SMEs or large companies Universities or public research centres. innovation and technology centres.

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Spain	ES_09 FEDER - Fostering R&D and Innovation in Objective 1 and 2 Regions (1997-1999)	www.seui.mec.es	1997	The FEDER Programme represents a new financial initiative of Government and has been provided funds during 3 years. This measure is not a novel measure, since it is aimed to similar objectives that PETRI Programme New kind of grants that finance partially R&D projects, where the measure's annual budget is >500 Keuro, but each project receives approximately 100 Keuro to finance additional costs of activities. The goal of the projects must be the research co-operation between Public Research Centres (CPI) and companies and the transfer to knowledge and technology, where the firms must support the activities with dedicated resources: financial, equipment or personnel.	Transfer & exploitation of results	universities, public research organisms and technology centres companies
Spain	ES_10 Financial support of non-profit Technology Transfer Offices (1996-)	www.cicyt.es	1996	Since 1.989 until 1.996, National R&D Plan gives subsidies to Public Institutions that decides to create a Technology Transfer Office. Economic support to the Technology Transfer Offices (OTRIs) will allow these liaison organisations to launching and performance of strategic plans that originate a better and more effective interrelationship between Public Research Centres /Universities and productive environment and strengthen their work in a network	Transfer & exploitation of results	Public Research Centres, Universities, Entrepreneurial Associations, Technological Centres and Research Associations.
Spain	**ES_12 Cooperation projects – P4 Modality (2000-2003)**	www.seui.mec.es	2000	The National Plan for Scientific Research, Technological Development and Innovation (abbreviated as NP) activities will be carried out through National Programmes basically defined by scientific-technological areas, which include basic and applied research. The call of 8th March 2000 by the State Secretary of Education, Universities, Research and Development (SEUI) opens the NP. This call has distinguished four modalities or types of actions supported, including P4 Modality. R&D Co-operation Projects among Universities or Research Technological Organisations and firms. The introduction of the concept of consortium to carry out R&D projects, is the outstanding in comparison with previous measures.	Transfer & exploitation of results Demonstrator projects	Research Institutes SMEs/Industrial SMEs Universities
Spain	**ES_13 R&D projects National Programmes (2000-2003)**	www.seui.mec.es	2000	The P3 Modality provides a framework to support applied research projects, which address the priority technological areas of National Programmes. The aim is to foster the collaborative projects between Research Technology Organisations, Universities and industry. The broad objective is to intensify the transfer of knowledge to business and to strength the research carried out by firms.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Spain	**ES_14 National Food Programme (2000-2003)**	www.inia.es	2000	The National Programme of Food is one of the sectoral programmes of the National Plan for Scientific Research, Technological Development and Innovation (IV NP) and is included in the Work Programme for the year 2000. This measure establishes three types of actions to be supported: A. R&D Projects: basic research projects (A.1) and applied research projects (A.2). B. R&D&I Projects: technological development projects. C. Co-operative R&D&I Projects: basic, applied and technological development projects carried out by a consortia.	Transfer & exploitation of results Demonstrator projects	Large Companies/Large Industrial Companies Research Institutes SMEs/Industrial SMEs Universities

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Spain	**ES_15 National Programme of AgroFood Resources and Technologies (2000-2003)**	www.inia.es	2000	The main objective of this key action is to preserve genetic resources interesting for the agrofood sector. The measure aims at avoiding loose in genetic diversity and guaranteeing the availability of genetic pools for genetic improvement. Furthermore, this action promotes co-operative R&D projects between Public R&D institutions and Enterprises (modality II: applied R&D). The programme has two kinds of actions to be supported: Basic R&D projects, Applied R&D projects	Transfer & exploitation of results Demonstrator projects	Public Research Institutes Large Companies/Large Industrial Companies Other Research Institutes SMEs/Industrial SMEs
Spain	**ES_16 National Programme of Environment: R&D and Innovation Projects (2000-2003)**	www.itge.es	2000	The National Programme of Environment is included in the Work Programme for the year 2000 of the National Plan for Scientific Research, Technological Development and Innovation. Priority Areas: 1.- Recovering of polluted lands. 2.- Managing urban, agricultural and industrial fallout. 3.- Pollution in agriculture and water. 4.- Environmental indicators. 5.- Studies related to the evaluation of environment quality.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Research Institutes SMEs/Industrial SMEs Universities
Spain	**ES_17 PROFIT: Programme to encourage technological research (2000-2003)**	www.min.es	2000	PROFIT's main goal is to support innovative enterprises through horizontal actions and instruments designed to improve the enterprise environment. This include, for instance, actions oriented to improvements in information and advice, co-operation with enterprises, quality and design, creation of technology-based enterprises, providing mechanisms overcoming the usual difficulties in obtaining suitable financing, especially risk capital in start-up phases. Regarding this last element, the objective is to foster the consolidation of risk capital, to improve the mobility of scientific and university personnel to enterprises and to promote young entrepreneurs. Besides this, the set of public support instruments will be reoriented, focusing on the encouragement of enterprises' investment in intangibles and supporting these enterprises not only with subsidies but also by completing the financial markets.	Transfer & exploitation of results Mobility of personnel Information diffusion	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs
Spain	**ES_19 INFO XXI: The Information Society for all (2000-)**	infoxxi.min.es/presentacion.htm	2000	INFO XXI is an strategic initiative o the Spanish Government aimed at implementing Information Society in Spain, in order that its citizens and enterprises can take part in its development and take advantage of its potential to improve social cohesion, quality of life and work and economic growth.	Transfer & exploitation of results Demonstrator projects	Individuals Other Public Authorities/Organisations Researchers Students in upper secondary schools

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Spain	**ES_20 Special Actions of National Programmes (2000-2003)**	www.seui.mec.es	2000	This heading includes other ways of supporting the activities of the National Plan for Scientific Research, Technological Development and Innovation (abbreviated as NP) and, in general, of Science-Technology-Enterprise System (S-T-E System), which do not fit in others measures and that refer to specific actions such as the following: - Aids to promote the participation of Spanish groups in international scientific co-operation programmes, with special reference to the EU R&D Framework Programme. - Support to the thematic networks in which various actors of the S-T-E system participate, with the aim of promoting co-operation among actors and facilitating the exchange and transfer of knowledge. - Aids to the organisation of conferences, seminars and one-day events in Spain, especially those with an international character.	Transfer & exploitation of results Information diffusion	Large Companies/Large Industrial Companies Research Institutes Universities
Finland	FI_1 SPINNO (1990-)	www.spinno.fi	1990	A joint venture of scientific institutions, technical research centres, public authorities and the business community in the Helsinki area other institutions to stimulate and accompany spin off companies. Its aim is to establish 40-50 new high-tech companies a year. SPINNO offers several forms of support to the newly formed companies, such as: Training. Tailored combination of government grants and other methods of support (technical, etc.) can be obtained to set up a new company. Venture capital is available through. SPINNO-seed Ltd). External consultants and experts that can be hired on a limited basis. Legal services are the most frequently used by companies. A support and advisory programme in which companies are assisted by sponsors- 'mentors' who are experienced business leaders. Accommodation in one of the science parks of the area. Up to 2 years of leave of absence, which can be granted to the researchers wishing to start a new company. Very flexible rules regarding the transfer and payment of intellectual property rights as a way of fostering start-ups by researchers.	Transfer & exploitation of results Mobility of personnel Information diffusion	Graduates Researchers
Finland	FI_5 Centre of expertise programme (1994-2006)	www.intermin.fi/suom/oske	1994	The aim is to enhance regional competitiveness and to increase the number of high-tech products, companies and jobs. To achieve this goal, the programme will be used to implement projects reflecting the needs of industry, to encourage industry, research and training sectors to co-operate, to ensure rapid transfer of the latest knowledge and know-how to companies and to exploit local creativity and innovation.	Transfer & exploitation of results Demonstrator projects	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs Universities
Finland	FI_10 Technology transfer from universities and research organisations (1999-2001)	www.sitra.fi	1999	Enhance transfer of technologies from universities and research institutions to the market place; build best practices to all Finnish universities and to the university-industry interface; concentrates on identifying, evaluation, commercialisation and licensing of novel innovations.	Transfer & exploitation of results Information diffusion	Public Authorities/Organisations Universities

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
France	FR_12 Creation of Incubator structures (1999-)	www.education.gouv.fr/technologie/mesur/incub.htm	1999	The objective of the program is to move towards a more interactive model based on consortia where universities and publics bodies (research structures) are to make a better contribution to the creation of innovative firms. A national call for project was launched in March 1999 to select new incubator structures at a regional level.	Networks & clusters Transfer & exploitation of results	Research Institutes Universities
France	FR_17 Technological Research and Innovation Networks (1998-)	www.education.gouv.fr/technologie/reseaux/defaultb.htm	1998	A new key measure for the Government to structure public and private research and establish co-operation. The objective is to develop public and private partnerships with the creation of national thematic networks linking public laboratories and enterprises, including SME's in well defined fields. The Network will received a share of public research funding. The research should be on short term demand and contribute to the creation of innovative firms	Networks & clusters Transfer & exploitation of results	Research Institutes
France	FR_27 FRATT (?-?)					
France	**FR_28 National Centres for Technological Research (2000-)**	www.education.gouv.fr/technologie/reseaux/defaultb.htm				
Greece	GR_16 EKVAN (1997-2000)					
Greece	GR_17 Development of microelectronics technology and micromechanics (1998-)					
Greece	GR_19 Research and innovation in Agricultural Biotechnology (1998-)					
Greece	GR_26 AXIA – Exploitation of successful projects of STRIDE and EPET 1 (?-?)					
Ireland	IE_22 Technology Centres (1989-)					
Ireland	IE_23 Graduate Enterprise Programme (1995-)					
Ireland	IE_24 Campus Companies Programme (1996-)					

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Italy	IT_01 Special applied research fund (1997-)	www.murst.it	1997	The special applied research fund may subsidise the projects which aim to carry out industrial research activities and/or pre-competitive development ones.1. Industrial research: planned research or investigation aiming to acquire new knowledge to develop new products, processes, and services or to improve existing ones.2. Pre-competitive development activities: the use of research results to develop a plan, project or design for new, modified or improved products, processes or services which are to be commercialised or used.	Demonstrator projects Transfer & exploitation of results	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs
Italy	IT_02 Employment in the field of research (1997-)	www.murst.it	1997	The main objective is to promote the recruitment of graduates (with previous experience in research), masters and doctorates to carry out research activities. The three action lines are described hereafter. 1. Support for temporary placement of graduates, masters and doctorates in research projects. 2. Temporary secondment of researchers and technicians from public research organisations to industry for a maximum period of 4 years and which may be renewed only once. 3. Contribution to the social charges of graduates, masters and doctorates who replace the personnel seconded under point 2.	Transfer & exploitation of results Mobility of personnel	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Italy	IT_03 Support for the promotion of scientific culture (1997-)	www.murst.it	1997	The main objective is to support the activities which aim to promote scientific and technological culture. The following organisations may be supported: 1. Institutions and associations with extensive experience in the diffusion of scientific and technological culture and in the exploitation of the national natural, scientific, technological and industrial heritage. 2. Astronomical observatories, botanic gardens and natural and scientific museums which aim to enhance the co-ordination of their activities and to promote specific projects on environmental education. 3. Institutes, school consortia, student or teacher associations, companies and other entities which aim to improve the communication between education and science, research, and industry. 4. Miscellaneous.	Transfer & exploitation of results Information diffusion	Research Institutes
Italy	IT_04 Autonomous research projects in the regions lagging behind (1995-)	www.murst.it	1995	This measure may subsidise the projects which aim at carrying out industrial research activities and/or pre-competitive development ones in Objective 1, 2 and 5b areas, and, in particular: 1. Industrial research: planned research or investigation aiming to acquire new knowledge to develop new products, processes, and services or to improve existing ones. 2. Pre-competitive development activities: the use of research results to develop a plan, project or design for new, modified or improved products, processes or services which are to be commercialised or used.	Transfer & exploitation of results Demonstrator projects	Companies
Italy	IT_05 Research centres in the regions lagging behind (1995-)	www.murst.it	1995	This measure may subsidise the realisation of new research centres and the restructuring, enlargement, de-localisation of existing centres in the underdeveloped areas.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Italy	IT_07 Measures aimed at sustaining innovation (1997-)	www.minindustria.it	1997	The measure, which is managed by the Ministry of Industry, aims at proposing fiscal benefits in order to support industrial research and development. These tax incentives can be obtained in presence of a specific R&D and innovation item in the beneficiary firm's balance sheet. This should encourage enterprises to make explicit their innovation activities. At the same time the automatic procedure reduces the risk of administrative inefficiency.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Italy	IT_08 Research assignments to public research laboratories and SMEs (1998-)	www.minindustria.it	1998	As for Law n. 196, this measure aims at encouraging the employment of people with Laureat or doctoral degrees by SME. In this case the incentive takes the form of a tax credit. The measure also allows firms to use the fiscal incentive to pay for R&D projects carried out on their behalf by public research laboratories; this scheme has the objective of fostering cooperation between industry and public research institutions.	Mobility of personnel	SMEs
Italy	IT_11 Reorganisation of Fund for Research Support (1999-)	www.murst.it	1999	The scope of this Law consists of a reorganisation of the regulation and a simplification of the procedures in the field of scientific and technological research, technology diffusion, mobility of researchers. This decree disciplines the initiatives sustaining industrial research and the connected training and technological diffusion.	Mobility of personnel	Large Companies/Large Industrial Companies Research Institutes SMEs/Industrial SMEs
Italy	IT_15 Reorganisation and establishment of public research centres (1999)	www.murst.it	1999	In 1999, a number of decrees have been issued in order to provide the public research bodies with new rules, as well as to establish new ones. In particular, they deal with the reordering of: CNR ENEA ASI Experimental Stations IRSA and the institution of : Istituto di Studi ed Analisi Economica, ISAE, from the merger of ISCO and ISPE, the National Institute of Astrophysics (INAF), the National Institute of Geophysics and Volcanology and dispositions concerning the research body under the MURST control.	Mobility of personnel	Public Authorities/Organisations
Italy	IT_18 Large research projects (1988-)	www.murst.it	1998	The measure may subsidise the large projects which aim to carry out industrial research activities and/or pre-competitive development ones.	Demonstartor projects	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes Researchers Universities
Italy	IT_23 Reordering of promotion bodies and establishment of Sviluppo Itlalia (1999)	www.sviluppoitalia.it		Sviluppo Italia is the national development agency which was created by legislative decree on 9th January 1999 in order to enable Italy to promote its activities and to ensure that the states full potential is known to the international marketplace. Its mission focusses on three areas for this development: regional promotion, investment attraction, development of sectors with a high degree of technology	Transfer & exploitation of results	???
Italy	**IT_25 CSF Objective 1 2000-2006/PIA (2000-2006)**	www.minindustria.it	2000	The new CSF Objective 1 2000-2006 introduce the so-called "PIA-Pacchetti Integrati di Agevolazione" (Integrated Financing Measures). These PIA are: PIA Innovazione (innovation); PIA Formazione (training); PIA Networking. The PIA is a measure that allows the enterprises to present a single multi-annual programme of development to obtain grants from different sources. The enterprise, through the presentation a single application, can get grants for a number of purposes, as the acquisition of equipment, the setting-up of networks, the purchase of services and consultancy, the realisation of common infrastructures.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Italy	**IT_26 Agreement Sviluppo Italia – MURST (2000 -)**	www.sviluppoitalia.it	2000	The agreement between MURST and Sviluppo Italia to set up new technology based firms through research spin off has come into force in February 2000. It is an experimental programme involving the research areas of the University Federico II (Napoli), Sannio (Benevento), Lecce and Catania. The project aims at supporting professors, researchers, students…which are interested in developing and marketing the results of their own research activities. The project proposes free services for the project and start-up phases.	Transfer & exploitation of results	Graduates Research Institutes Researchers Universities
Italy	IT_32 MURST Directive 1310 (1999-)	www.murst.it	1999	In the absence of the regulations for the implementation of Legislative Decree no 297 27 July 1999, it is necessary to provide recommendation for the implementation of art.4 of Law No 46 , 17 February 1982 (SMEs undertaking research activities), and art. 9 of the Ministerial Decree 8 August 1997. The Directive disciplines: - the presentation of the applications - the request for the registration in the labs list	Transfer & exploitation of results	SMEs/Industrial SMEs
Italy	IT_33 MURST Directive 760 (1999-)	www.murst.it	1999	MURST directive no. 760 29/12/99 concerns the transitory disciplines for the activities supporting the industrial research, in the absence of the regulations for the implementation of Legislative Decree no 297 27 July 1999. It states that, from 3 January 2000: - MURST will take the accounting responsibility of the Fondo Ricerca Applicata (Applied Research Fund) and, in the future, of the FAR (Fund for the Research Support); …	Transfer & exploitation of results	Large Companies/Large Industrial Companies Public Authorities/Organisations SMEs/Industrial SMEs Universities
Netherlands	NL_01 Business-oriented Technological Cooperation Projects (1997-)	www.minez.nl	1997	The objectives are to increase investments in R&D by companies, and, to increase the return on these investment through promotion of co-operation between business themselves or between companies and (semi-) public research institutes in a broad range of technology fields.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Research Institutes SMEs/Industrial SMEs
Netherlands	NL_07 BIT Industry oriented International Technology Cooperation (1997-)	www.senter.nl	1997	Goal is promoting participation of Dutch companies in international technology programmes. Designated international technology programmes are: a. Eureka; b. technology co-operation with industrialised countries; c. technology co-operation with developing markets.	Transfer & exploitation of results Demonstartor projects	Companies

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Netherlands	NL_13 EET (Economy, Ecology and Technology) programme (1997-)	www.minez.nl/subs	1997	Goal is long-term support for sustainable technological developments. EET projects should consist of basic research with clear economic possibilities for application and which confirm to the three-fold goal of the EET programme: 1. Economy: promoting sustainable economic growth by cost reduction, enlarging market possibilities and playing into environmental chances. 2. Ecology: finding real solutions for ecological problems by substantial environmental improvements within the program themes; 3. Technology: structural improvement of the knowledge position of the Netherlands by enlarging the innovative power of companies and knowledge institutions, and by promoting co-operation between companies and between companies and knowledge institutions	Transfer & exploitation of results	Companies
Netherlands	NL_14 SMO Subsidies Maritime Research (1997-)	www.minez.nl/subs	1997	Goal is promoting maritime research, especially by stimulating knowledge transfer between companies and research institutions.	Transfer & exploitation of results	Companies
Netherlands	NL_18 IOP Innovation Oriented Research Programme (1998-)	www.minez.nl/subs	1998	Goal is stimulating innovation oriented technological research by universities and other non-profit research organisations. More specifically it should lead to fine tuning this kind of research with long term needs of companies. Next to this universities can apply for training of researchers abroad. Finally proposals can be submitted by universities and non-profit organisations to apply for a patent, in order to support current projects.	Transfer & exploitation of results	Universities and other non-profit research institutions
Netherlands	NL_19 Technological Top Institutes (1998-2006)	www.minez.nl	1998	Technological Top Institutes are new centres of excellence concentrating existing knowledge and people in a particular field of technology. Industry is closely involved in defining the long-term strategies of these Institutes, which conduct strategic-fundamental research.	Transfer & exploitation of results	Large Companies/ Large Industrial Companies SMEs/Industrial SMEs Research Institutes Universities
Netherlands	NL_29 ICES/KIS (1998-)		1998	The measure is an investment impulse in the knowledge infrastructure.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs
Netherlands	NL_31 Technology Foundation STW (1981-)	www.stw.nl	1981	The Technology Foundation STW has a twofold mission: 1.to finance and stimulate high-quality scientific research and 2.to promote the application of the results of this research, the utilization.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Research Institutes Researchers Universities

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Norway	NO_10 BRIDGE Programme (1994-) (* modified 1998 – covers programmes below)	www.forskningsradet.no		BRIDGE is a bridge-builder for the development of long-term relations and concrete co-operative projects between enterprises with limited R&D experience and various R&D facilities. Efforts are made to strengthen enterprises' expertise in various ways, in the technological and non-technological spheres alike. The programme is designed to formulate and test measures that will bridge the gap between enterprises and R&D facilities. These measures are to act as a catalyst, providing impetus so that the practices and information strategies of the R&D facilities are better adapted to the needs of SMEs. Similarly, BRIDGE aims to stimulate co-operation in innovation by helping enterprises, trade organisations, R&D facilities, local authorities and other relevant players to co-operate in establishing innovation networks.	Transfer & exploitation of results Networks & clusters	SMEs/Industrial SMEs
Norway	NO_11 FORNY II – research based innovation & establishment (1999-2004)	www.snd.no	1994	The FORNY programme is to improve the ability to commercialise research-based business concepts or ideas conceived at universities, colleges and research institutes. To professionalise the process of commercialisation in order to increase the number of and quality of concepts in existing companies and/or the process of setting up new innovative companies. To turn the commercialisation of research-based business concepts into a strategic area of activity and set up a permanent service of commercialisation of research-based business concepts through the establishment of a company that can deal with all aspects of the commercialisation process, legal and financial. FORNY is organised as four regional programmes.	Transfer & exploitation of results	Graduates Individuals Research Institutes Researchers Universities
Norway	NO_12 TEFT – tech. transfer from technological research institutes to SMEs (1994-2003)		1999	The TEFT programme is to improve SME's technological development capability by providing impetus and funding for technology projects involving technological research institutions and SMEs. The programme's most important instrument is a nation-wide, proactive, corps of technology attachés that engage enterprises in direct dialogue, determining their needs and potential.	Transfer & exploitation of results	Research Institutes SMEs/Industrial SMEs
Norway	NO_14 SME Competence (1994-2003)	www.forskningsradet.no	1997	SME-Competence is to strengthen the SME's ability to innovate and create added value by raising their formal level of competence. It has been considered important to increase the level of co-operation between regional R&D institutions, like R&D institutes and regional state colleges, and companies. A large number of Norwegian colleges are involved in the project, since they supply project managers and supervisors.	Transfer & exploitation of results Mobility of personnel	Graduates SMEs/Industrial SMEs Universities
Norway	NO_23 SME Colleges (1994-2003)	www.sol.no/forskningsradet/program/bro/html/smb-h_gskole.htm	1999	In order to strengthen the competence of SMEs and the contact between SMEs and industry, the Research Council of Norway has implemented SME Colleges. SME Colleges is part of SME Competence (NO_14). It was established in 1999 as a two year long pilot project. Possible measures are: Reorganisation of exciting study programmes or the establishment of new, in order to develop new relations between colleges and companies. Intensify the use of companies in the learning situation. Intensify the use of college personnel as advisers vis-à-vis companies. Making colleges more accessible to companies. Develop life long learning for SMEs.	Transfer & exploitation of results	SMEs/Industrial SMEs HEIs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Portugal	PT _01 R&D activities by consortia (1994-1999)	www.adi.pt	1994	The objectives of the Programme are:1. To foster the co-operation between enterprises and R&D organisations with a view to exploiting their results;2. to enhance the enterprise's technological, innovative and organisational capabilities;3. to have a significant impact on the economic and technology system.The projects to be funded may:a. seek to transfer and adapt generic or horizontal technologies to sectoral applications with a view to develop new products, processes and services;b. support the participation in consortia which carry out concerted RTD activities at national, European or transnational level;c. integrate training RTD activities with technological consulting ones.	Transfer & exploitation of results Networks & clusters	Large Companies/Large Industrial Companies Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs
Portugal	PT_02 Recruitment of Doctorates and Masters (1994-1999)	www.adi.pt	1996	The objectives are to enhance and secure the competitiveness of Portuguese companies by supporting the recruitment of highly skilled labour with experience in R&D activities. In this context, financial incentives are offered to recruit doctorate students and, in exceptional cases, master's students to underpin the technological base of companies.	Mobility of personnel	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Portugal	PT_07 Development of Technological Capabilities at enterprise level (1997-1999)	www.adi.pt	1997	The main objective is to develop the technological capabilities of SMEs and their ability to access to external ones.Three different actions are proposed to achieve the above objective:1. development of technological capabilities at enterprise level;2. development of long-term co-operation strategies between SMEs and R&D organisations;3. projects with high visibility amongst SMEs	Transfer & exploitation of results	SMEs/Industrial SMEs
Portugal	PT_09 Financial incentives to R&D industrial projects (1994-1999)		1994	This particular measure intends to support industrial investment decisions on research and development projects, aiming also to expand the co-operation between public research institutes and industrial firms. The measure includes two actions : ACTION A - Feasibility studies for R&D projects OBJECTIVES : to stimulate companies to undertake technological and commercial feasibility studies to support later R&D investment projects. ACTION B – Research and development projects	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Portugal	PT_10 Innovation and Technological Transfer measure (1994-1999)		1995	This particular measure has four main aims: promotion of industrial companies awareness of the benefits of innovation; fostering the interaction between Knowledge sources and users; promotion of the participation of Portuguese firms, especially SMEs, in European and international R&D co-operation programmes; and launching mobilising projects for technological development	Transfer & exploitation of results Demonstrator projects	Large Companies/Large Industrial Companies SMEs/Industrial SMEs
Sweden	SE_01 SNITS (Small and New companies' development of innovations and technology transfer support) (1994-pending evaluation)	www.nutek.se/teknik2/teksprid/snits.html	1994	The objective of SNITS is to motivate SMEs to carry out advanced technical R&D projects. In SNITS important technological topics are exposed to small businesses, which are invited to propose advanced R&D work of their own within those topics. The technological topics normally have a relatively wide scope, so that the small businesses can carry out innovative work with the flexibility needed for innovation. An important feature of SNITS is that the small business is required to create an early strategic customer relationship during the feasibility study (often to a large company), and initiate discussions with potential investors. Thus the adaptation for an early market entry can be facilitated.	Transfer & exploitation of results	SMEs/Industrial SMEs/Industrial SMEs

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
Sweden	SE_02 Seed Finance (1980s-)	www.nutek.se		To provide high risk loans with interest and conditional repayment or grants with a royalty clause to SMEs and primarily to small technology based firms for innovation projects in pre-commercial stages. This programme includes national support to EUREKA project participants. It is a regular programme, continuously on-going. The normal target group is very small firms. The goal of the support is to develop the innovation project to a stage where commercial financing is feasible.	Transfer & exploitation of results	SMEs/Industrial SMEs
Sweden	SE_04 Competence Centre Programme (1995-2006)	www.nutek.se/teknik2/komp/nutek.html	1995	The Competence Centre Programme is a link in NUTEK's efforts to develop university-industry interaction in Sweden. The programme means that new forms of university-industry collaboration are tested. These centres contribute to • collaboration between academic researchers and personnel from industrial companies in concentrated and integrated research aimed at long-term benefits for the companies as well as for the universities and researchers; • active industrial participation in formulating strategic goals and in implementing academic research; • development of the ability of academic researchers to organise and carry on targeted research programmes which presuppose collaboration with several industrial companies and university departments, including the handling of Intellectual Property Rights; • enhancement of the research profile of the various universities and strengthening of their active industrial collaborations; • faster transfer of new technology to Swedish industry; • strengthening of long-term research collaboration, technical competence and renewal in Swedish industry.	Transfer & exploitation of results	Large Companies/Large Industrial Companies Universities
Sweden	SE_06 Regional Technology Programme (1995-2000)	www.nutek.se	1995	This programme represents an area of utmost importance to the government as it both covers the upgrading of Swedish SMEs and an increased interaction between SMEs, universities and other research centres. To upgrade the general competence and technological capacity of SMEs and create new links with both private and institutional actors. The programme aims to establish networks through the involvement of universities, research centres and other local actors. Larger firms are involved through the purchase of specific competencies. The efforts are initiated by groups of companies (demand-driven), each company group has a joint concept for the development of their competence and technology during the five year period. For each project the firms receive one third of the funds from the government and must accordingly pool their resources with their partners to raise the remaining two thirds.	Transfer & exploitation of results	SMEs
Sweden	SE_07 New Graduate Schools (1996-)		1993	The main goal is to increase the number of graduated PhDs and examination rate in sciences of strategic importance to Swedish industry with an industryrelated and/or transdisciplinary and/or international angle. They aim at stimulating university-industry collaboration as well as collaboration between different universities.	Transfer & exploitation of results	Universities, Graduate students Employers in the private sector
Sweden	SE_09 New liaison functions (1997-2002)	www.nutek.se	1997	This measure fits very well into the ambition to increase the interaction between the universiites and industry and to give the new universiites an important role in the regional development. To increase the co-operation between the new universities/university colleges and SMEs primarily in their regions	Transfer & exploitation of results Networks & clusters	SMEs
Sweden	SE_11 Active Industrial Cooperation (?-?)	www.nutek.se/teknik2/teksprid/ais.html www.nutek.se/teknik2/fouomr/mattek/vamp.html				

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
United Kingdom	UK_01 Foresight Programme (1993-2001)	www.foresight.gov.uk	1993	Foresight programme brings industry, researchers and government departments to identify wealth creation and quality of life opportunities in markets and technologies over the medium and longer term, and the actions and investments required to exploit these opportunities. The overall aim of the Foresight programme is to secure sustained competitive advantage and enhanced quality of life by creating enduring networks linking business, the science base and government by identifying opportunities in markets and technologies over the medium and longer term, and the actions and investments required to exploit these opportunities. The opportunity to network and establish links with different communities and sectors is regarded by participants as one of the most significant benefits of taking part in the Foresight programme.	Transfer & exploitation of results Information diffusion Networks & clusters	Large Companies/Large Industrial Companies Other Public Authorities/Organisations Research Institutes SMEs/Industrial SMEs
United Kingdom	UK_18 Teaching Company Scheme (1987-) (funding doubled in 2000)	www.dti.gov.uk/support/tcs.htm		The TCS aims at enabling firms to take advantage of the scientific, engineering, technological and business management skills and knowledge available in universities. Each TCS programme involves one or more highly qualified graduates (TCS Associates) working in a company for two years on a project which is central to the company's needs. TCS programmes are jointly supervised by academics and company staff.	Mobility of personnel	Universities (HEIs) SMEs
United Kingdom	UK_19 Faraday Partnerships (1999-2000)	www.dti.gov.uk/COMMS/dtiexweb/pages/pg05d.htm	1999	The Government is to establish a network of Faraday Partnerships, building on the pilot programme of the Engineering and Physical Sciences Research Council. The main goal is to promote more effective links between research and commercialisation through linking businesses, scientists and engineers in universities and research organisations, and capital providers. This interaction is to be improved through the involvement of intermediate organisations. The focus is on collaborative research projects although some may also support programmes of education and training, including provision for full-time training at Masters and Doctoral level.	Demonstrator projects Mobility of personnel	Researchers in HEIs and Independent Research and Technology OrganisationsIndustry
United Kingdom	UK_20 Foresight LINK (1995-)	www.foresight.gov.uk	1995	Foresight LINK Awards are for the support of collaborative projects between academic institutions and industry which address Foresight priorities. LINK is a major delivery mechanism for collaborative programmes which respond to Foresight. LINK provides a framework for the support of pre-competitive research projects undertaken in partnership by businesses and universities and other research base organisations. The objective is to select a range of imaginative collaborative research projects which should encompass elements of technology transfer and might also encompass training, with companies and research base organisations working in partnership to address Foresight priorities.	Demonstrator projects Transfer & exploitation of results	Industry/commercial sector and representatives of the science base, such as HEIs, research council institutes, government research establishments, hospitals or independent research organisations.
United Kingdom	UK_21 Science Enterprise Challenge (1999-2001)	www.dti.gov.uk/COMMS/dtiexweb/pages/pg05d.htm	1999	To establish up to eight centres of enterprise in UK universities. Centres will be world class establishments for fostering the commercialisation of research and new ideas, for scientific entrepreneurialism and incorporating the teaching of enterprise into the science and engineering curricula. Centres are expected to become world class in knowledge transfer and excel at turning good ideas into good businesses.	Transfer & exploitation of results Networks & clusters	Universities

Coverage	*Measures*	*Web site*	*Date*	*Content Summary*	*Mode of operation*	*Targets*
United Kingdom	UK_22 Higher Education Reach-Out to Business and the Community (1998-2003)	www.hefce.ac.uk/news/hefce/1999/fpc.htm	1998	The scheme provides funding to help universities and colleges build on existing links with industry and to develop a more strategic approach. The mechanisms whereby these links may be developed are broad and Government is not prescribing in detail the activities to be funded, which could include the establishment of centres of expertise in Higher Education Institutions to develop business links; training and development for staff, including staff exchange programmes; "one stop shops" in universities and colleges so that businesses have easy access to advice and expertise.	Transfer & exploitation of results	Large Companies/Large Industrial Companies SMEs/Industrial SMEs Universities
United Kingdom	UK_23 University for Industry (1999-)	www.learning.org.uk	1999	As part of the government's commitment to lifelong learning, the University for Industry scheme has aimed to deliver education to adults, through home PCs and in the workplace. It works in partnership with a number of organisations including colleges, Training and Enterprise Councils and libraries. A sophisticated on-line system underpine the project.	Transfer & exploitation of results	SMEs/Industrial SMEs
United Kingdom	UK_29 Joint Research Equipment Initiative (1996-)	www.hefce.ac.uk	1996	Funding of equipment in areas of high quality research. Open to institutions which obtain contributions from industry or other sponsors of research. Intended to redress decline in university equipment provision particularly in leading edge areas.	???	Universities
United Kingdom	**UK_34 Regional Competitiveness Development Fund (2000-)**	www.dti.gov.uk/europe/mf4.htm	2000	The UK Government is actively pursuing a long-term policy of regionalisation. This involves increasing the autonomy of Wales (through the creation of a Welsh Assembly), Scotland (through the devolution and the creation of a Scottish Parliament (Executive) and the English regions. In the case of the latter, a number of Regional Development Agencies have been established and tasked with the development and promotion of strategies for improving regional economic performance and enhancing their region's competitiveness. Many of the RDAs are now in the process of producing draft competitiveness strategies, which cover all aspects of their region's (economic) development, benchmark regional performance, and propose plans for promoting growth.	Transfer & exploitation of results Networks & clusters	SMEs/Industrial SMEs
United Kingdom	UK_37 Biotechnology Exploitation Platform Challenge (1999-)	www.dti.gov.uk/beps/index.htm	1999	The Biotechnology Exploitation Platform Challenge (BEP Challenge) aims to anchor the benefits of publicly funded bioscience research in the UK. It encourages syndicates of universities, academic institutions and intermediaries with complementary bioscience research to work together and build portfolios of intellectual property. In particular, it aims at securing the necessary skills to: audit existing intellectual property in bioscience departments in academic institutions and identify commercial opportunities by matching portfolios of intellectual property with potential industrial markets	Transfer & exploitation of results Networks & clusters	University Technology Transfer Companies Research Technology Organisations Trade Associations Intermediaries in the management of bioscience IP

5.3.Technology Transfer

Summary Comments - based on Country Reports

Country	*Action Line Context*	*Date: Start End*	*Summary Interpretation of relevant comments in Country Report*	*Changes this T-C Period?*	*Reference to policy measures*
Austria	III.4		There is a strong policy emphasis on co-operation between universities and business, implemented via various programmes.	N	
	I.2		Ongoing mobility schemes in Austria can be compared with EU schemes; they focus on initiating contact between students and industry.	N	
Belgium	III.4		There is a major focus on improving co-operation. Networks and clusters are encouraged		
	I.2		Schemes exist to facilitate mobility, the creation of spin-off companies and to upgrade SME capability.		
Germany	III.4		Rich, complex established mechanisms but scope for improvement to support steps towards the formation of new industries and new economy (e.g. to introduce more dynamic networks)	Y	**DE_36** Networks of Competence (2000-) **DE_51** LEARNET: network based learning in SMEs (2000-)
	I.2		There are attempts to attract more international students to German university courses. This move recognises the increasing internationalisation of business. There are schemes to facilitate the interchange of experienced researchers but salary scales compatibility is a problem. In some sectors such as information technology the rules about recruiting non EU staff are being relaxed.	Y	
Denmark	III.4		Continuation only.	N	
	I.2	1998	There are schemes to support and encourage PhDs in a business context Icebreaker projects started - to stimulate environmental or design projects in SMEs via graduate placement.	N	
Spain	III.4		New schemes for cooperative R&D projects plus continuation of support for intermediary organisations	Y	**ES_12** Cooperation projects – P4 Modality (2000-2003) **ES_13** R&D projects National Programmes (2000-2003) **ES_14** National Food Programme (2000-2003) **ES_15** National Programme of AgroFood Resources and Technologies (2000-2003) **ES_16** National Programme of Environment: R&D and Innovation Projects (2000-2003) **ES_17** PROFIT: Programme to encourage technological

					research (2000-2003) **ES_19** INFO XXI: The Information Society for all (2000-) **ES_20** Special Actions of National Programmes (2000-2003)
	I.2		Training and mobility of research personnel is an objective in the National Plan, IV NP, (2000-2003)	Y	
Finland	III.4		Close cooperation has been regarded as a national strength, especially via TEKES national technology programs, which continue. Clusters programme is more recent		
	I.2				
France	III.4		Cooperation is a top priority. The 1999 innovation Act facilitates the management of university R&D activities 'as a business' – e.g. permitting contracts and companies to manage research. May 2000, the formation of research networks continues beyond 10 New initiative - National Centres for Technology Research Incubators an ongoing activity.	Y Y	**FR_28** National Centres for Technological Research (2000-)
France	I.2		Mobility of researchers has been re-emphasised. Engineering students and researchers to SMEs Recruitment of younger researchers Encourage interdisciplinary activities. 4 year contracts to link universities and public laboratories. The effectiveness of the above measures needs to be evaluated.		
Greece	III.4		A decline in co-funding programme for problem oriented research Big boost in support for cooperation via EKVAN (e.g. in environmental, bio, IT, materials, and management) Ongoing support for sectoral RAs and technology parks	Y Y	
Greece	I.2		Financial support for PhDs where there is business-university cooperation Researcher manager networks EKVAN may (indirectly) become a more effective stimulant of mobility "The Ireland Techstart programme might be a useful model for new policies in Greece"		
Ireland	III.4		Proposals for database, brokerage, alliances and clubs, networks, training and mobility, and understanding culture and management	Y?	
Ireland	I.2.		Cross-border (Northern Ireland and Republic of Ireland) graduate placements under examination.		
Italy	III.4		Radical redesign of the university structure is pending.	Y	**IT_25** CSF Objective 1 2000-2006/PIA (2000-2006)

			A directory of laboratories established under a previous scheme is now regarded as unsuccessful.		**IT_26** Agreement Sviluppo Italia – MURST (2000 -)
	I.2.		Some rationalisation of laws in 1999 to try to increase the effectiveness of cooperation and to stimulate the recruitment of graduates by SMEs.		
Luxembourg	III.4				
Luxembourg	I.2		Early postgraduate work in Luxembourg MUST be international (no facilities in Luxembourg) so mobility is a necessity.		
Netherlands	III.4		The role of applied research organisations such as TNO and large technology institutes has a major influence. Subsidy schemes continue	N	
	I.2		Interchange and collaboration for training is long established and relatively sophisticated. KIM Knowledge Carriers tries to stimulate graduate employment in SMEs.		NL 6
Portugal	III.4		Existing actions for cooperation will be strengthened. (e.g. to also support consortia)	Y	
	I.2		The reinforcement of programmes to encourage the recruitment of PhDs and MSc graduates into business is expected. The result of existing policies has been modest.	Y	
Sweden	III.4		Centres and graduate research schools have been promoted over the last 10 years and 5 years. Cooperation tends to be discussed as better exploitation of public resources rather than a need for industry to acquire more expertise.		
	I.2		Mobility is a by-product of new centres aimed at strengthening particular research areas. Seven new centres so far.	Y	
UK	III.4		Recognition of the failure of UK industry to exploit inventions and available technology permeates policy thinking. Cooperation programmes aim to upgrade SME expertise as much as transfer specific technology. Existing programmes such as Teaching Company Scheme have been strengthened.	Y	
UK	I.2		Mobility is a co-incidental rather than primary objective of programmes such as the Teaching Company Scheme and Faraday centres. Postgraduate Training Partnerships (PTP) change the focus and nature of PhD training in designated subject areas, incrementally influencing the culture and direction of university research.	N	**UK_34** Regional Competitiveness Development Fund (2000-)

Norway	III.4		The importance of cooperation is recognised in existing policies		
	I.2		Mobility has been integrated with other measures		
Bulgaria	III.4		None		
	I.2		None		
Czech Republic	III.4		None		
	I.2		None		
Estonia	III.4		None		
	I.2		None		
Hungary	III.4		None		
	I.2		None		
Latvia	III.4		A science park and a technology park have been initiated		
	I.2		None		
Lithuania	III.4		None		
	I.2		None		
Poland	III.4		Generally there is an unfavourable climate for cooperation. There is some limited private business support for individual researchers rather than institutions. Technology research institutes are not yet acting as adequate intermediaries and are not yet privatised.		
	I.2		None		
Rumania	III.4		None – there is a need for improvement. in commercialisation and cooperation		
	I.2		For period 2000-2004 the need for support for mobility has been recognised, but there are no mechanisms yet specified.		
Slovakia	III.4		None		
	I.2		None		
Slovenia	III.4		2000 - networking and cooperation are specifically encouraged	Y	
	I.2		Some financial support for collaborative projects has parallel benefit for mobility but limited effect due to salary differentials between public and private sectors.		

5.4. Country reports – Action lines III.4 and I.2

Action Line III.4 - Intensified co-operation between research, universities and companies

Austria - AT
Intensified relations between research, universities and industry are one of the main goals of the Austrian innovation policy. The most important programme in this field is the k plus programme (AT_23) which aims at installing centres where joint precompetitive research between companies and universities is carried out. Two other projects which have a similar objective are k ind/k net (AT_27) and TechGate Vienna (AT_24). The Impulse Polytechnics – Industry project (AT_22) can also be added to programmes of this kind. Contacts between research and industry on a less institutional level are promoted via the Relay-Projects Science-Industry (AT_20) the Impulse Projects (AT_19) and the FFF Young Researchers Programme (AT_28).

Belgium - BE
The majority of innovation policy efforts in Belgium concentrate on the goal to achieve better flows of information and better co-operation between the research and the industrial worlds. The starting point of this vision is the acknowledgement of the high quality and concentration of research capacities in the country, and the relevance of efforts to valorise this asset for economic development purposes.

In the two regions of Flanders and Wallonia, "impulse" or "mobilising" programmes, open to research institutions and enterprises, have been supported in recent years and account for a large share of the regional R&D budgets (BE_42). Collective or other research centres (see BE_01) have the mission to diffuse the research results in the enterprise world. In the former centres, "technological attachés" are the main instruments for building this linkage between research and industry.

Since 1997, Flanders has organised a networking structure to gather all institutions offering innovation support services to enterprises, the "IWT-KMO-Netwerk" (IWT-SME-Network)[7]. The principle is that every member of this network acts as an entry point to reach the most relevant partner for the company. The network is co-ordinated by IWT.

Several schemes in Flanders have a built-in condition of collaboration between the research centre or university and the enterprise: this is the case with the KIV scheme (BE_14), and the HOBU-Fund (BE_12). One original scheme is the "equipment for research on materials" measure (BE_20), which permits the access to laboratories by enterprises, without the need to enter into a common research project. Other schemes, such as the demonstration projects on new technologies (BE_25) also favour collaborative projects between enterprises and research organisations.

The cluster and technology valley policies in Flanders are also a way for the regional authorities to promote research-industry collaboration, since the clusters/technology valleys have very often developed around a node, in which a research or training institution plays a key role. Collaboration between research and industry is supported in Wallonia by the FIRST schemes, (BE_36), and by the actions of university interfaces (BE_47).

[7] See www.iwt.be/kmonet.htm.

Germany - DE

Technology-oriented networks between the private sector and the institutions of the public research infrastructure are – viewed from an international perspective – rich and complex. There is a variety of channels for technology transfer available. In addition, the federal government and the Länder governments provide support to technology transfer agencies and information databases. However, there is ongoing discussion on how to improve co-operation between technology producers and technology users. The existing system is considered slow and inefficient in transmitting knowledge, especially as the need to increase the speed of exploitation of knowledge seems to be a more urgent requirement in the face of globalisation and short product cycles. In addition, it is sometimes stated that co-operation between public research and private companies is strongly based on networks in existing technology and also based on the existing industrial structures. There seems to be a need to adjust the German system to the needs of a knowledge-based service society.

The federal government intends to develop an integrating concept for technology transfer in order to broaden existing technological networks and to integrate previous technology transfer outsiders into the networks between technology-oriented firms, universities and public research institutes. It is also worth mentioning that networking aspects are more and more integrated into an increasing number of government support programmes. This is based on the observation that the most efficient form of knowledge transfer between public institutions and the private sector is the face-to-face transfer of (tacit) knowledge. Indirect transfer of knowledge via special agencies is viewed increasingly as of second order relevance.

Some recent policy measures to improve the transfer of knowledge and technologies between companies and public research institutions include measures like InnoNet, Competence Networks in Medicine, InnoRegio and ProInno which are described in more detail in the relevant datasheets (see http://trendchart.ip.lu). Only some short examples are highlighted below.

The “InnoNet” Innovation Programme (DE_26) is supposed to improve co-operation between SMEs and research establishments from as early as the R&D phase and to initiate a comprehensive collaboration of research establishments. In the “InnoNet” programme, ambitious combined projects providing the basis for the development of innovative products, processes and services are supported. In the framework of these projects, at least four SMEs work with at least two research establishments (i.e. universities and technical colleges, non-university research establishments, federal research institutes, as well as external non-profit-making organisations of industrial research in the new Länder).

The Competence Networks in Medicine (DE_27) competition aims to assist and promote the utilisation of available potential of scientific innovations in research establishments for solving practical, clinical problems. For this research it is necessary for the basic researchers to shed some light on the causes of illness, closely collaborating with those who develop new therapies and with the doctors who test the success of these therapies under surgery conditions. In 1999, nine winning networks were selected by an international jury.

In addition, the BMBF fosters the introduction of co-ordination centres for clinical studies (Koordinierungsstellen für klinische Studien) at seven German universities. The centres should serve as contact points for firms looking for hospitals to test new medical products, co-ordinating such studies and act as a mechanism to enhance the quality of clinical studies conducted in Germany.

The Technology Information Centres (Fachinformationszentren; DE_29) provide support to search for information and a quick access to various databases on literary references, facts and

especially on specific research programmes, supportive measures, research projects, research results as well as technology-transfer-centres and innovation-centres. By offering this information, the applicants and the recipients of research subsidies are to be brought to state-of-the-art science and technology.

Several private information agencies (DE_30) enable SMEs who cannot afford to have or choose not to develop their own databases to call on professional information brokers for data search. Professional information brokers have a lot of experience in working with databases, know retrieval language codes, have access to the relevant hosts and bring in other specialised knowledge on the subjects. They are paid by current remunerations. The information-imparting-agencies offer various kinds of support/subsidies like sharing of general and specified information; access to original versions of literature as well as translations, edit information in a comprehensible way and analyse certain data sources.

Further measures aiming at the strengthening of research co-operation between public research and the firm side are the Lead Projects (DE_25) and the Compound Research (DE_41), both financed by the BMBF and aiming at the promotion of research both at public research institutions and at companies in promising fields of technology. The programme Technology Alliance (DE_43) is a network of research institutions and professional technology agents which aims to bring together both suppliers and users of technologies. Its purpose is to group human resources of the members in the network and to accelerate the knowledge transfer between public research and industry.

Denmark - DK

Two of the measures from the Trend Chart have their main focus here. That is the Centercontract-scheme (DK_7), and the Approved Technological service Institutes (DK_8). The intention of the Centercontract-scheme is to intensify the corporation between universities, private companies and the technological service institutions. The means available for these schemes are part of the total funds that available to the Rådet for Technological Service in its work. Approximately 13 million EUR a year has been granted in recent years. One of the criteria for a company to get this co-financing is that the building-up of know-how at the technological service institute must be of use in the institutes corporation with other companies.

Spain - ES

The strengthening of the S-T-E system and the improving of interactions between research providers and companies is one of the primary targets of the Government. The IV National Plan foresees the provision of mechanisms to reinforce cooperation and reduce the obstacles to the formation of alliances and cooperation networks.

To do so, the IV NP includes different modalities of participation, which facilitate the cooperation among different types of actors. The cooperation covers different grades of commitment, from a simple declaration of a company interested in a project or research activity developed by a research organism or group, through to full participation in consortia.

An example in this area is provided by the Co-operative R&D projects, a new modality designed to promote the cooperation among agents of the S-T-E System for the development of R&D activities related to the scientific-technological areas and sectoral areas. These projects are carried out by consortia made up of different kinds of research performers.

It is worth mentioning an indirect instrument to foster cooperation between research centres, universities and firms: the support to interface units. Although this is an old instrument, the IV NP intends to reinforce the role of these units, which form part of the S-T-E system. They

channel the firms' technological demands to the public system and facilitate the technology knowledge transfer between the agents of the S-T-E system.

Finland - FI

Close co-operation between companies, research organisations and universities is often considered as a special strength of the Finnish system of innovation. The single most important ongoing activity within this field has been the Tekes national technology programmes. These are firm-oriented in the sense that they have been planned with the needs of industry in mind, and have been implemented in collaboration with the firms. Planning takes place in workgroups and seminars involving firms, universities and research organisations and the explicit aim of the programmes has been to promote collaboration between these parties. Each programme has a steering group, a co-ordinator and a representative from Tekes. Universities of technology and research organisations, such as the VTT have led most of the programmes. The duration of the programmes ranges from three to five years and their average volume range from FIM 30 million to hundreds of millions (EUR 5 to 600 millions). Tekes usually finances about half of the costs of the programme. The programmes have also functioned as good frameworks for international R&D co-operation, e.g. within the EU's Framework Programmes. In 1999, a total of over 60 programmes were underway.

Apart from Tekes' ongoing technology programmes, the cluster programmes represent the most recent developments. These have been in operation since 1996, and are funded out of the programme for additional R&D funding. The cluster programme aims at supporting R&D that strengthens industrial clusters by promoting co-operation in certain industrial fields, or around certain themes (FI_8). Clusters have been identified in a large research project undertaken by the Research Institute of the Finnish Economy. Moreover, there are various regional initiatives and schemes, which mainly concern the establishing of framework conditions conductive to innovation, most notably the centre of expertise programme. Part of the R&D funds channelled e.g. through the TE-centres finance co-operative R&D projects. The EU's structural funds, in particular the objective 2 RTDI funds and measures, also play an important role since they are typically integrated in regional projects of domestic origin.

France - FR

Improving cooperation between research and industry is one of the top priorities of the French Government and a number of measures have been implemented.

The 1999 Innovation Act is proposing administrative reform for research status, allowing universities and public laboratories to contract private research contracts and have private companies within their structures.

The Technological Research and Innovation Networks (FR_17) were created in May 1998. Their objective is to support co-operation between public research and private companies in research fields considered as priorities by the Government and where the work done by existing structures is insufficient. Networks bring together professionals, manufacturers, and public research teams on projects within identified research sectors. An executive Committee for each Network is in charge of defining the priority actions of the Network, and reviewing projects. Projects are presented for support through calls for project or spontaneously. They are supported through the Network members equipment's and by financing from the MEFI and the Ministry of Research. In May 2000, ten Networks were created:

- telecommunication research network (www.telecom.gouv.fr/rnrt/)
- transport research network (www.education.gouv.fr/technologie/prog/predit-0.htm)
- Nanotechnology network (www.rmnt.org)

- Battery network www.education.gouv.fr/technologie/reseaux/pile.htm
- Genome Network (plant field)
- Civil and urban engineering network (rgc&u@equipement.gouv.fr)
- Human Genome Network
- Software Technology Network
- Process and Material Network
- Health Technology Network

The creation of National Centres for Technological Research (FR_28) commenced in March 2000. Its objective is to bring together public research laboratories and large private research centres to develop collaborative technological research activities. The Centre is geographically identified and focuses on one field of competencies. The organisation of the Centre and the terms of collaboration are under the responsibility of each Centre's members. The Government will support the collaboration through access to specific juridical framework and a possible financing support for shared equipment's. Today, 17 National Centres are in preparation, including: Telecommunication in Sophia-Antipolis, Space in Toulouse, and Energy in Marseille.

Other measures helping to bring together public research and enterprise include: the incubator structures (FR_12) and the seed-capital fund (FR_13).

Greece - GR

The original support programme for co-operation was the "Co-funding Programme" (SYN) (GR_12), which supported problem-oriented joint research. This programme has been diminishing in its relative importance, as there were very few applications. Research co-operation has been massively enhanced through EKVAN (GR_16), offering wide opportunities in selected areas of environmental research, bioscience, agricultural research, information technologies, new materials, culture and management. This programme is among the most generous ones of the GSRT.

In addition AXIA (GR_26) is a special programme supporting the diffusion of technologies obtained under STRIDE and EPET I funding.

Continuous support to sectoral research associations and technology parks are also viewed as means of co-operation, yet with diversified and overall moderate success.

In the period November 1999 - April 2000, no change was observed in this area. Projects selected under previous calls continue to be implemented.

Ireland – IE

Towards the end of 1999 Forfás with the assistance of Enterprise Ireland prepared a paper aimed at developing a set of base recommendations for strengthening the transfer of research results and knowledge from the HE (Higher Education) sector and PRIs (Public Research Institutes) to industry.

The recommendations build upon:

- the findings of a commissioned survey of SMEs to ascertain their need for and access to the research competence in the HE sector and PRIs;
- the findings of the 1996 HE Research Survey.
- discussions with Deans of Research in the Universities, Heads of Developments in the Institutes of Technology, as well as Teagasc, Marine Institute, Hyperion, IRDG, IBEC and ISME.

The project focuses on the specific factors that can inhibit or enhance the transfer of the results of 'non-commissioned'-type research and the often 'tacit' knowledge of researchers from both the higher education (HE) sector and public research institutes (PRIs) to industry.

The main views emerging from the surveys of both users and generators are that: there is a continuing cultural gap and lack of communication between the two sets of players in the transfer process, and there is a lack of appropriate information on the sources of expertise within the public research sector

The recommendations were:

- A database of research results/technical expertise within the public sector should be made available to companies so that they can more easily identify appropriate expertise for the development of new products and/or processes.
- Enterprise Ireland should provide a technology brokerage activity between the companies and the HE/PRI researchers and other appropriate sources.
- Research and marketing alliances should be established within the HE sector and between that sector and the public research institutions and complementary R&D clubs should be created by the research institutions and should include industrial participants.
- Industry itself should utilise existing groupings or where appropriate, establish "user" groups and networks with the assistance of the development agencies or their representative bodies. In some cases of intensive networking with the public sector, a joint venture company could be a suitable vehicle for undertaking such co-operation.
- Each research institution should provide appropriate and regular training for both researchers and managers to enhance the interface with industry. The NITM (National Institute of Technology Management) and equivalent technology management programmes should include an appropriate module that would raise the understanding of industry of the needs and priorities of researchers.

The recommendations have been referred to ICSTI for further consideration of the broad policy issues raised in this paper and to Enterprise Ireland and other research institutions, where appropriate, for the specific delivery mechanisms.

Italy - IT

After years of neglect, university research, both fundamental and applied, has undergone a complete renewal. New procedures have been introduced in 1997 to evaluate and select research projects of national significance; these procedures are wholly computerised and will be the responsibility of a Committee of Guarantors, appointed by the Ministry, with the direct involvement of the national and international scientific community (anonymous referees and objective assessment and financing criteria). Progressive increases in the funds made available by the State for research projects will be co-financed by the universities concerned.

In 1998 1,645 projects were submitted to the Ministry involving some 10,000 research groups and, on average, 44 researchers per project. Projects were reviewed by some 2,000 experts. Comparing the results achieved in 1998 with those of the previous year, some positive adjustments have been achieved in terms of improving the "quality" of the proposals submitted:

- a 20 per cent decrease of proposals submitted;
- a significant decrease of the number of research groups per programme, as recommended by the Ministry with the aim of building specific research groups rather than thematic networks;

- a 12 per cent decrease of the total financing requested, even though the maximum share of financing from MURST was raised from 60 to 70 per cent.

The *Law 449/97 (art.5)* (*see also "mobility of students, research workers and teachers"*) allows firms to use the fiscal incentive to pay for R&D projects carried out on their behalf by public research laboratories; this scheme has the objective of fostering cooperation between industry and public research institutions in a more effective way than the one envisaged by Law 46/1982, which established a directory of public laboratories available to provide R&D services, and which is rather unsuccessful.

Luxembourg - LU

The very foundations of this co-operation were laid with the law of 1987 on research in the public sector and technology transfer to private companies, which took shape above all through Public Research Centre's co-operative projects with private companies.

It is expected that the approach of poles of technological competence will help to strengthen links between PRCs and companies.

Netherlands - NL

In the Dutch S&T system universities conduct basic and applied research on the one hand, alongside an extensive system of applied research organisations such as TNO, DLO and the so-called Large Technology Institutes (GTI's).

Universities are funded foremost by OCW. In addition to basic funding, they can acquire research funding from the Research Council NWO and the Academy (KNAW), and from 'third tier' contract research such as the EU Framework Programmes and Medical Foundations. Although 'third tier' contract research is increasing (20% of research expenditure in 1996), research commissioned by industry is decreasing and formed 17% of university contract research activities in 1996.

The applied research organisations acquire around 60-90% of their income from research contracts, the rest through basic government funding. TNO is the main semi-public research organisation employing around 4000 people. TNO has often been criticised to work for medium and large firms yet only marginally for SMEs.

Since the early 1990s the collaboration between research, universities and companies has been an important item on policy agendas. Several instruments were developed accordingly, especially by the EZ, including the Technological Top Institutes (NL_19); R&D subsidy schemes which promote collaboration, such as BTS (NL_1), SMO (NL_14) and EET (NL_13). The BTS scheme is generic, while SMO and EET promote co-operation in the area of maritime research and economic growth, ecology and technology, respectively.

Besides instruments that encourage co-operation directly, there are a number of initiatives that induce research institutes and universities to direct research efforts more toward the needs of business. The most obvious instrument is the Innovation-oriented Research Programmes, IOP (NL_18). This is a umbrella-scheme of subsidies to universities and non-profit research institutes for research projects in pre-determined technological areas that meet the long-term needs of business. Second, as described above semi-public organisations such as TNO and DLO need to acquire a majority of their funding through external contracts. Moreover, funding of TNO by the ministry of Economic Affairs is contingent upon co-financing by firms.[8] As universities are

[8] TNO, *Annual Report 1998*, Delft.

funded by OCW they have relatively few direct incentives to collaborate with industry. The third initiative in this respect is the Technology Foundation STW (NL_31). EZ and the Research Council NWO jointly contribute dfl 36.2 million to the Technology Foundation STW. The aim of the contribution is to promote high-quality technical-scientific research and its application by business in particular. Finally, the projects that are funded in the context of ICES/KIS (NL_29) also involve private-public co-operation..

Portugal - PT

There is a need for increased cooperation between research organizations, universities and companies in Portugal. In spite of a few positive cooperation projects (of which, IBET, the Institute for Experimental and Technological Biology, is a good example) there is no tradition of cooperation between university and industry. It seems evident that for such linkages to be created, specific needs and knowledgeable people ("bridge-builders") have to be in place. Policy measures may help but do not solve the underlying problem.

Both PEDIP II and PRAXIS XXI included several actions with the purpose to promote cooperation between Universities and Industry (for example, PT_1, PT_9, PT_10 and PT_12). It is thus unsurprising that this issue will figure high again in the new operational programmes for 2000-2006. Though information on the exact design of actions is not available so far, the setting up of consortia or other forms of cooperation between companies and other institutions of the scientific and technological field will be granted financial support in the context of the following measures:

- favouring modern and competitive firms strategies (measure 1.2. of POE);
- supporting activities and products with a strategic dimension (measure 2.1. of POE);
- mobilizing new ideas and new entrepreneurs (measure 2.2. of POE); and
- stimulating the cooperation between R&D institutions and firms (included in sub-programme 2 of IOCTI).

Sweden - SE

Since a very large share of Swedish public R&D resources historically have been devoted to the higher education sector, there has always been a discussion on how society could profit by the R&D work carried out by universities and university colleges. The beginning of the nineties brought with it an escalation of this debate. In 1996, the debate was codified in the Higher Education Act, through the amendment that:

> *"The Higher Education Institutions shall also [besides providing education and performing research and development] co-operate with the surrounding society and inform about their activities."*

This amendment has brought with it an increase in the activities aimed at connecting universities/university colleges and foremost industry. The range of activities has expanded so much that voices are being raised for the need of larger co-ordination and transparency of the system. Many critics also point to the fact that co-operation tends to be treated in separate organisations, while the intent of the legislator was to establish more of an integration of the co-operation task and the two traditional tasks of education and research. In 1998, the debate was coming to live again as the parliamentary committee on research in the next decade proposed the reformulation of the amendment from 1996 to:

> *The higher education institutions shall participate in taking charge of IPRs stemming from any research result and in enabling research results to come to practical use.*

This proposal was vividly criticised in many of the answers in the referral procedure, since it was seen as codifying an interpretation of the co-operation with society as a one-way communication phenomenon instead of the dialogue touched upon in the 1996 formulation.

Public initiatives in the field include the building of Competence Centres - joint ventures between universities, industrial firms and research institutes (SE_4). This measure was introduced in 1995, with a planned life-span of 5 to 10 years and with the aim "to achieve a stronger industrial impact and enhanced concentration of resources by creating multidisciplinary academic research environments in which industrial companies participate actively and persistently in order to derive long-term benefits". The centres are up to 40% financed by NUTEK, the rest split by the other two actors, university and industry. Over the period March 1995 - July 1996, 28 NUTEK competence centres at eight universities were approved after negotiations and started their activities. Also, over the last five years a series of New Graduate Research Schools have been founded in order to increase the interaction between academia and industry (SE_7).

Another instrument being used to promote the interaction between research and industrial development is the Industrial Research Institutes (IRI; Industriforskningsinstitut).The first industrial research institutes in Sweden were founded in the 1940s. Since then new institutes have been founded and today there are around thirty IRIs. Over recent years there has been a shift in orientation with the oldest IRIs being oriented towards industrial sectors and the younger ones focusing on technology areas. As previously stated the institutes are few and small in an international comparison.

United Kingdom - UK

One major feature of Government and ministerial statements on UK innovation policy has been a longstanding recognition of the failure of UK companies to successfully translate the successes of the science base into internationally competitive products, processes and services. As a result, UK innovation policy has increasingly focused on ways in which this situation may be remedied (although, perhaps investigation of the specific causes of this failure have received less attention). Thus, a number of measures designed to foster links between the science base (particularly the higher education sector) and industry have been introduced over recent years. Examples include the Teaching Company Scheme (UK_18), the CASE (Co-operative Awards in Science and Engineering) schemes operated by the UK research councils and a number of more specific schemes also operated by the research councils, either singly, jointly or in partnership with other government departments.

New initiatives in support of this objective include a substantive increase in the budgetary allocation of the Teaching Company Scheme (UK_18), the extension of the pilot scheme of the Faraday Partnerships (UK_19), the establishment of the Foresight LINK scheme (UK_20), the Science Enterprise Challenge (UK_21), the Higher Education Reach-Out to Business and the Community (HERO-BC) initiative (UK_22), the University for Industry (UK_23) and the Joint Research Equipment Initiative (UK_29). In addition, it is highly likely that the Regional Competitiveness Development Fund (UK_34) will evolve, at the regional level, a number of specific measures to encourage strategic partnerships between universities and local industry.

Cyprus - CY

There is no special provision for the intensification of co-operation but networks are welcome to submit proposals to open calls.

Iceland – IS

No measures have been reported under this heading.

Israel - IL
Each of the five universities in Israel, operating technological faculties, manages a subsidiary for commercialisation of the fruits of its research and development efforts. These companies are business oriented and strive to make the most of their assets whether by direct sell or by mutual farther development. Intensive large-scale co-operation between research, universities and companies is driven by the MAGNET programme.

MAGNET is the Hebrew acronym for "Generic Pre-Competitive Technologies and R&D". Generic Pre-Competitive technologies refer to widely applicable components, materials, manufacturing methods and processes, design methods, protocols etc. The Magnet programme was launched in July 1992, under the office of the Chief Scientist in the Ministry of Industry and Trade, in order to strengthen the Israeli industry's technological expertise and enhance its competitiveness in international markets. The programme aims to achieve a more efficient allocation of limited financial and professional resources through the scientific and technological cooperation between industrial companies and between them and academic research institutes. The intellectual rights of the technological developments within the framework of a Magnet Consortium belong to the party that developed it, however, each member of the Consortium has the right to use the technology for the development of its own products. Companies and institutes in a Magnet Consortium are entitled to special benefits and incentives.

Norway - NO
The Government White Paper on Research underlines the need for co-operation between companies and R&D institutions.

The public user-oriented R&D programmes are to strengthen the collaboration between firms and universities, colleges and R&D institutes (NO_02). The NT-programme (NO_03) is to develop network between companies and knowledge institutions, and so is FORNY (NO_11), TEFT (NO_12), SME-Competence (NO_14), REGINN (NO_13) and SME-Colleges (NO_23)

Bulgaria – BG
With its new policy for economic growth, alleviated taxation and relevant legislation the Government is aiming at fast improvement of the links between the research, universities and companies. On one hand the research and scientific activities will be directed to a greater extent to the applied research, on the other hand information on newly developed technologies and products will be expanded. The efforts of the Government are supported also by other organisations in the research sector. At the Spring Trade Fair in May 2000 in Plovdiv for example the Union of the Scientists in Bulgaria organised, for the first time an "Innovation Exchange" and interested visitors were offered a data base for technological development, innovative research works, etc. The success of this initiative motivated the organisers to organise such "exchanges" regularly on the fairs in Plovdiv.

Czech republic - CZ
No specific measures are in place in support of this Action Line objective.

Estonia - EE
No specific measures have been announced in this category.

Hungary - HU
The Hungarian government relies on co-operation research centres to facilitate closer links between research and industry through bringing the institutions of higher education, non-profit research institutes and the business sector together. However, no measures have been explicitly specified.

Latvia - LT
The Latvian Technology Centre and Latvian Technology Park are the main two organisations in Latvia that have made co-operation between scientific and business communities one of their main areas of activity. Refer to the Latvia Country Report for more information on these organisations.

Lithuania - LI
No new measures address this objective.

Poland - PL
There is a lack of co-operation between research institutions and companies. Research carried out in large Polish firms indicates that most of them are oriented toward foreign innovations. They are interested in comprehensive technology transfers of the turn-key kind, with a repayment schedule that will not affect their cash flow. Such conditions are still hard to find in the Polish market. Most firms are trying to address the issue of technology transfer through the gradual construction of a national collaborative network and reliance on their own modest R&D capacity. These firms appreciate the knowledge and competence of Polish engineers and scientists and are financing their own engineering R&D. In general, they do not establish design bureaux of the kind still to be found in state enterprises, but set up engineering teams closer to, or actually within, the production process. Most large private Polish firms consider co-operation with universities or R&D institutes to be unprofitable.

Such companies usually have good contacts with academic and science circles in their field, but they prefer co-operating with researchers rather than the institutions that employ them. Companies are interested in offering researchers fixed-term contracts - not full-time employment. They appreciate the value of individual scientists, but consider universities and research institutes too expensive and badly equipped. For the Ministry of Economy, which supervises most of technical research institutes, they also represent a burden (mainly financial). For several years the Ministry of Economy has been considering privatising the institutes but until now no reasonable programme exists.

According to the research made by the GUS in 1996, only 11.3% of companies had agreements or contracts with scientific institutes (and 7.1% with universities) for research and development works.

Romania - RO
The problem of transforming the results of research into products and services has plagued the Romanian economy for a long time. One of the reasons for failure to implement research results is the lack of capital to finance investments. Currently, no measures addressing this problem are known.

Slovak Republic – SK
Within the objective “gearing research to innovation”, the Government has adopted three programmes - Micro-loan Programme (SK_1), Technology Transfer Programme (SK_2) and Quality Management System Implementation Programme (SK_3) - which support SMEs. These measures, however, have not been implemented at the time of the most recent country report (June 2000).

Slovenia - SO
Currently, the Ministry of Science and Technology’s subsidies are geared towards cooperation among enterprises and research groups in terms of project financing [SO_2]. To foster

public/private exchange, the MZT also subsidises technology parks and centres [SO_3]. Nonetheless, the Statistical Office study shows a deficiency of government funding of private R&D.

The new "Law on support for enterprises in the development of new technologies and establishment and operation of their R&D units in the period from 2000 to 2003" makes "incentives for networking and common activities in the field of R&D" one of its central programmes.

Action Line I.2 - Mobility of students, research workers and teachers

Austria - AT
Austria's EU membership provided access, for Austrian students, to Community programmes aiming at increasing mobility such as LEONARDO, SOKRATES and TEMPUS. Unlike these European programmes, the Impulse Projects (AT_19), FFF Young Researchers Programme (AT_28) and the Young Innovators scheme (AT_17) aim at initiating contact between students and industry. All three measures have a different target group: while the Impulse Projects promote Post-Docs, the FFF supports undergraduates at the university and the Young Innovators Scheme student at upper secondary schools.

Belgium - BE
Generally speaking, there are still numerous barriers to mobility between research and industry in Belgium.

Wallonia has developed an interesting series of measures, the "FIRST" schemes (see BE_31, BE_36, BE_37, BE_38, BE_39), aiming at fostering relationships between university and industry through the mobility of researchers. The Region finances part or the whole of salary costs of researchers, either at university or in firms, provided their research project is carried out in collaboration between university and industry. The new generation of FIRST schemes targets notably the creation of spin-off companies by university researchers.

The KIV scheme (see BE_14) in Flanders shares the same objective, but is designed to reach less research-intensive SMEs. The first implementation phase of such a scheme was not very successful, probably because of the difficulty to conciliate views and modes of operation of "standard" SMEs and those of university laboratories. Policy learning has taken place and the scheme has been reformulated so as to overcome these barriers. In fact, the KIV scheme is meant to get employment for people with higher technical education into SMEs.

Germany - DE
Mobility of personal is seen as the most important source of technology transfer and technological co-operation between private enterprises and institutions of the technological infrastructure. In addition, international exchange of students is gaining importance in a globalised economy. Several recent studies also highlight the lack of attractiveness of German universities to foreign students.

Since 1998 several German universities and Fachhochschulen have established new courses particularly designed for foreign students through financial support (see DE_04) from the BMBF. The profile-concept includes favourable study conditions for foreign students as well as guaranteed international qualification of the German students. It aims to overcome language barriers by providing German as well as English lectures. At the same time German-as-a-foreign-language courses will be offered. Moreover, a period of study abroad will be an integral part of the curriculum. The German conference for the Ministry of Education and the Arts agreed on a process for the accreditation of Bachelor and Masters degree schemes. However, job prospects of such degree schemes must be brought into the discussion. As desirable as it may be to make the Bachelor a self-standing degree, it is equally as necessary for those who have opted to do it to open up clear prospects regarding their working life. Combining closely with representatives of the economy will be striven for, in order to make these prospects possible.

In addition, there are government programmes which support the exchange of research personnel between industry and the research infrastructure by granting support to the researchers in order to recover existing wage differentials between the public and the private sector. A further measure in this respect is the planned reform of the remuneration scheme at universities which will –

amongst other objectives – make it more attractive for researchers from the company side to move (back) to universities by allowing higher payments. Finally, there are ongoing discussions regarding the obstacles to experienced researchers in the public sector in moving to private research facilities (e.g. seniority based earnings systems in the public institutions, public pension system).

The immigration of workers from outside the EU to Germany is restricted by several legal measures. At the same time, economic experts estimate a current shortage in the supply of qualified IT-workers of about 75,000 which cannot fully be compensated by immigration from other EU countries or by short-term training measures. In order to satisfy short-term personnel needs in the IT sector, the federal government is opening up new regulatory avenues (while industry is expected to expand its training capacities and intensify supplementary training activities in the IT sector). The Emergency programme to satisfy personnel needs in the IT Sector programme (DE_45) was established therefore to meet the perceived shortage of qualified personnel in the sector. The programme will aim to do this through easier access to IT-jobs for top-level IT specialists from abroad. In a first step, up to 20,000 IT specialists may take jobs in Germany. Companies are called upon to post their job offers on an Internet homepage (Aktion IT 2000). Local offices of the Federal Agency for Employment will assist companies by finding IT-workers.

Denmark - DK

Two of the measures from the Trend Chart can be put under this sub-theme, namely the Industrial Research-scheme (DK 5) and The Icebreaker projects (DK 6). The intention of the Industrial Research-scheme is to permit students to obtain their PhD-degree through employment as researchers in private companies. The target groups of the Icebreaker projects is small and medium-sized companies (that is companies with less than 250 employees and a turnover less than 40 million EUR). There are really two types of projects, namely environmental icebreaker projects and designer icebreaker projects. The intention of the environmental icebreaker project is to have a person with a higher education to start up initiatives at the environmental and labour environmental area. The intention of the design icebreaker project is to 'break the ice' in the company's design endeavours, for example by unifying various aspect of the company in one design. There are approximately 4 million EUR available for 1998-2001.

Spain - ES

The new National Plan for Scientific Research, Technological Development and Innovation (IV NP) has been recently put into place. It runs for the period 2000-2003 and establishes as strategic objective the increasing of the qualified human resources both in the public and private sectors, focusing on the latter. Again the IV NP addresses the mobility of research personnel through one of its strategic objectives related to the promotion of mobility among the personnel of the different research centres and enterprises. The measures planned to fulfil this objective are coincident with the training ones, because they are oriented to both objectives: training and mobility.

Finland - FI

No major surveys have been conducted on the mobility of research personnel in Finland. Even though the mobility of personnel is considered as one of the most important mechanisms of knowledge transfer, mobility between the universities and the business sector has been more modest than expected. Thus the Science and Technology Policy Council has recommended promotion of expert mobility and intensifying its monitoring in its 1996 review (Science and Technology Policy Council of Finland 1996).

France - FR
As emphasised by the new Minister of Research in May 2000, the mobility of researchers is a priority for the Government. Two kind of measures for mobility can be underlined:

- **measures to support the mobility of engineering students or researchers to SME's**. Various measures exist at a regional level. They basically refer to a contract between a firm (with an innovative project), an engineer or a research student and a public research body in charge of training and managing the student. The firm receives subsidies or advances to hire the student for a specific period of time (no less than one year). Measures as CORTECH, CIFRE, ARI (FR_3, FR_6, FR_7) were extended with two new measures: Post doc (FR_14) and DRT (FR_24) implemented in 1997 and 1998. The 1999 Innovation Act is also willing to simply administrative procedures and legal status to allow researcher to work for innovative firms.

- **measures to promote mobility of researchers within public research structures and support young researchers.** Within the ten directions proposed by the Minister of Research in May 2000, three directions deals basically with mobility of researchers:
    - to bring down the average age of researchers through the support of young researcher teams: the Incentive Concerted Action for Young Researchers managed by the Ministry of Research supports teams willing to explore new fields of research. The measure is allocated € 12,3 million in 2000 (€ 8 million in 1999).
    - to promote interdisciplinarity and mobility through the strengthening of "welcome" laboratories. Few practical measures have been set-up as yet.
    - to bring together universities and research through mixed structures or measures included in the four years contracts between the State and universities.

But as underlined by the OECD report[9], the mobility of researchers will be most effective when evaluation criteria which apply to their careers take into account the exploitation of their work and the quality of partnership they are able to create with private businesses. Moreover, the new separation of the Ministry of Education and the Ministry of Research does not give a clear signal for the bringing together Universities and public research structures.

Greece - GR
There is limited mobility of students in Greece. Few HEIs in particular disciplines and all TEIs require practical training. The Ministry of Education is trying to enhance this through a call for tenders in an effort to help HEIs institutionalise practical experience of students. A broad number of departments have responded to this call.

Mobility, both geographical and inter-organisational is rather low in the country. In an effort to change this culture the GSRT has offered specific incentives under EPET II:

- At the post graduate level mobility is enhanced through the YPER programme (GR_11), which finances PhDs where an academic organisation and an economic agent are co-operating.
- Within the same programme the "Human Networks of Knowledge Promotion" envisage the creation of closer interaction and networking between researchers and managers in companies or utilities in order to diminish intellectual isolation, improve technology transfer and offer scope for interdisciplinarity.

[9] OECD report : OECD Economic Surveys (1999) : Structural policies Research and innovation in France

However, it can be noted first, that the budgets and limited scope of these programmes do not seem to address the problem of inter-organisational mobility. It is suggested that the introduction of a programme on the model of the successful "Techstart" measure in Ireland might be better suited to Greek needs. Second, EKVAN (GR 16), the major programme of support of R&D in areas of high economic interests foresees co-operation between companies and research organisations, and this may indirectly play a very important role for short term mobility. Finally to some extent, and for young researchers mainly, transnational research incentives from the EU further facilitate mobility. A particular programme of EPET supports the temporary work of Diaspora scientists in Greek research laboratories.

Bilateral agreements are in place with many countries supporting research and encouraging the mobility of researchers. In the period November 1999 - April 2000, the mobility of researchers was further enhanced through the signature of new bilateral research agreements or the renewal of older ones (GR_32).

Ireland - IE
Mobility issues are being examined as part of an on-going study on good practice in the field of graduate placements, North and South, at the new Cross-Border Trade & Business Development Body with a view to developing an all-island approach to the optimum utilisation of research and other skills.

Italy - IT
Italian SMEs employ rather unqualified personnel, and they do not typically employ people with university degrees, or doctoral degrees. They face difficulties in acquiring and using new technologies, in moving onto technologically more advanced sectors, in participating in R&D projects or investing in R&D themselves.

The *Law no 196, 24.06.1997* focuses on the employment of professionals with Laurea or doctoral degrees to be employed in research activities by SMEs. It allows for a contribution of 30 million Lire (equivalent to 0.02 million Euro) per year for a maximum of two years for each new employee with a doctoral degree obtained in Italy or abroad, and a contribution of 20 million Lire (equivalent to 0.01 million Euro) per year for a maximum of two years for each new employee with a Laurea degree. The maximum contribution granted to each firm cannot exceed 60 million Lire (equivalent to 0.03 million Euro). The new employees have to be employed with full time contracts lasting for at least two years, and their salary should not be lower than the average salary of people with that professional qualification. The funds made available in 1998 amounted to 5.5 billion Lire (equivalent to 2.84 million Euro). In the first year of enforcement of Law 196 MURST has received 137 requests for doctoral degree holders and 246 for laurea graduates.

Law N.449/97 has the same objective of *Law N. 196*. It aims at encouraging the employment of people with Laurea or doctoral degrees by SME but the incentive takes the form of a tax credit of 15 million Lire (7,746.85 Euro) per each new employee, up to a total of 60 million Lire for each beneficiary firm (30,987.41 Euro). In the first year of enforcement of Law 449, 368 requests have been addressed by firms to MURST for employees with a doctoral or Laurea degree. Altogether Laws 196 and 449 can allow Italian SMEs to employ more than 600 highly qualified personnel with a modest financial effort.

Law N.449 introduced an additional measure which allows firms to apply to universities or other public research institutions for seconding researchers or technical personnel to the firm for a period that cannot exceed four years. The individual keeps his/her employment relationship with the university or research institution, while the firm is asked to provide an additional compensation as an incentive.

The above Law allows firms to use the fiscal incentive to pay for R&D projects carried out on their behalf by public research laboratories; this scheme has the objective of fostering cooperation between industry and public research institutions in a more effective way than the one envisaged by Law 46/1982, which established a directory of public laboratories available to provide R&D services, and which is rather unsuccessful.

Up to now some obstacles affected the application of this mechanism, namely: difficulties in identifying individual competencies within public research agencies and universities to be made available to firms; the appropriate regulatory framework to be adopted; only a modest part of the research carried out in public research institutions may have a direct industrial application; and scarce interest of many "public" researchers in industrial and business initiatives.

The mechanisms included in Laws N.196 and N.449 are now inserted in a Law (D.L. 297/1999) which covers all MURST interventions concerning the coordination, promotion and implementation of measures aimed at sustaining research and innovation in industry by means of a unique fund which absorbs all the previous ones. The following aspects are defined by the law: beneficiaries, possible types of intervention, procedures, the modalities of coordination between MURST and the Ministry of Industry and Trade, other interventions for the support of innovation. The regulations for the implementation of the Law are expected to be issued by MURST in January, 2,000.

In addition, it should be noted that the development of an international, and specifically European, dimension in Italian Universities is one of the objectives to be reached in the next few years. The *MURST Decree 5 August 1999* (OJ no. 261 6-11-1999) introduces directives for the implementation of art. 14 of Law no 196, 24.06.1997.

Luxembourg - LU

The absence of university master degree courses in Luxembourg puts students in the advantageous position of having to continue their studies abroad. Due to the beneficial effects of this "forced" mobility as well as because of the immediate economic interest, the higher education policy has mainly focused on higher postgraduate courses which, in fact, constitutes a direct link towards (public) research. Thus, the majority of public research centres (PRC) co-operate within higher education establishments. At this level, postgraduate degrees are most often awarded in collaboration with well-known foreign establishments. In addition, research work associated with these degrees also implies transnational collaboration. It can therefore be reasonably considered that the mobility of researchers is, to a large extent, ensured.

Training-research grants of the Ministry of Culture, Higher Education and Research allow students and companies to be put in touch and the scientific interests and research of the former to be directed towards the very technological needs of the latter.

So far the promotion of student reception within the framework of the Leonardo da Vinci community programme for student mobility has given rise to a certain amount of interest within Luxembourg companies.

Netherlands - NL

No specific instruments are in place to ensure mobility of students, research workers and teachers. One of the problem areas identified in the latest Science Policy paper is precisely this lack of mobility inside Dutch academia. Nevertheless the Dutch higher education (HE) system does allow for professors to have part time appointments and in some universities having a second position in industry is quite normal.

Dutch higher education also has a long tradition of traineeships for students in industry or in the (public) service sector. This means that in a relatively advanced stage of their MA/ MSc graduate courses, students spend 6-9 months on a particular assignment in industry, often attached to their final thesis work. In the technical areas (engineering, electronics, IT etc.) this often implies that students work on a particular 'innovation project' within a company or on behalf of a company in the laboratory of the HE institutes. Combining learning and working by means of dual learning paths is rising fast, especially in higher vocational education.

Given the serious labour shortage, particularly in the technical areas, the outplacement of students is not a difficult task for the HE institutes and vocational education colleges. Enterprises see this as a good opportunity to test and recruit new talents. Smaller companies often complain of being squeezed out of this system by the larger employers in the region. The policy instrument KIM Knowledge Carriers (see NL_6) is meant to stimulate graduates to work for smaller companies.

Portugal -PT

In spite of the efforts undertaken, namely under PRAXIS XXI (PT_2), to stimulate the recruitment of doctors and masters by companies, the results were modest. In the context of the new IOCTI, it is expected a strengthening of the programmes stimulating the mobility of researchers between Universities and Research Institutions, on the one side, and enterprises, on the other. Information available suggests that such programmes will follow the lines already defined on the "Regulation on the Recruitment of Doctorates and Masters", although with some changes, stemming from the experience collected. They are, however, still to be published.

Sweden - SE

In the government research bill 1996/97 the need for increased measures was stressed for supporting young researchers and their mobility within Sweden and internationally. As part of that interest new graduate research schools have been created over the years. The large research foundations like the Foundation of strategic research, MISTRA and the KK Foundation have all financed new graduate schools that are set up in close co-operation with industry. Even though the primary objective of the schools is not to promote mobility but to increase the number of researchers within areas of strategic importance to Swedish industry and to stimulate increased co-operation between higher education institutions and companies, one expected effect is an increase in mobility (SE_7)

In the first half of the 1990s, when employment figures among civil engineers were high, a special programme aimed at encouraging the employment of civil engineers in SMEs without further acquaintance with such competence was launched.

United Kingdom - UK

A number of the measures already discussed under Action Line III.5 also explicitly promote the movement of students, research workers, academics, engineers and scientists between the higher education sector and industry, with the stated aim of encouraging the transfer of technology and the dissemination of know-how. Prime examples include the Teaching Company Scheme (UK_18) and the Faraday Partnerships (UK_19). The latter are to be increased in number after a successful pilot phase, probably through their amalgamation with the Engineering and Physical Science Research Council's Postgraduate Training Partnerships Scheme which involves collaboration between universities and Research and Technology Organisations in the independent research sector.

Cyprus – CY
The Higher Technical Institute is a member of the International Association for Exchange of Students for Technical Experience (IAESTE). Within this framework of IAESTE Cyprus secures industrial placements abroad for a number of its students during the summer vacations.

Iceland – IS
No measures have been presented under this heading.

Israel - IL
No measures have been reported under this Action Line.

Norway - NO
The systemic thinking that now permeates the innovation policy of the Research Council of Norway has led to a new interest for the mobility of students and researchers. The Council had a separate programme that should stimulate the mobility of knowledge workers like this. This aspect has now been integrated in other programs, e.g. SME-Competence (NO_14) and TIPS (NO_15).

The studies done so far do not indicate that there is a low rate of mobility from the university and colleges to industry in Norway (although the permanent faculty seem rather reluctant to find a career outside campus). On the other hand, relatively few people move the other way, from industry to the institutions of higher education. The researchers in the institute sector are more likely to move into the world of business enterprises.

Bulgaria - BG
In general, research workers, teachers and students are free to move to another work place. There are no specific measures to promote movement of scientific workers, students, engineers etc. between higher education and industry or business sector. Nevertheless the current economic development and conditions forced many scientific workers to moves to business and industry due to the employee cuts in SRD organisations. In Sofia and other bigger industrial/business centres, for better orientation and direction of the university graduates, “Career days” are organised regularly, where interested firms and organisations receive personal information or meet the graduates.

Czech republic - CZ
As stated above, this framework as yet does not exist. The Czech Government has not formulated an explicit policy on innovation fostering. Further information is to be verified.

Estonia - EE
No specific measures have been announced in this category.

Hungary - HU
A study on this subject has been undertaken by an individual research organisation. The expected date of the publication is end of 2000. According to our information no such study is available at the moment in Hungary.

Latvia - LT
In Latvia no specific measures have been passed to promote the movement of students, research workers, academics, engineers and scientists between the higher education sector and industry, with an aim to encourage the transfer of technology and the dissemination of know-how.

Lithuania - LI
There are no major acts on mobility of students, research workers and teachers in Lithuania. These issues are mostly regulated by agreements between universities, as well as by international programmes, such as Socrates.

Poland - PL
The mobility of students and researchers is very low primarily because of lack of cheap apartments for renting and low salaries of the scientific staff. Currently no measures explicitly address the issue.

Rumania - RO
The *Medium Term Strategy 2000-2004 of the Science and Technology Domain* specifies support for mobility of researchers, students and specialists as one of its objectives. However, no measures have been worked out to address the issue.

Slovak Republic - SK
No specific measures are reported under this Action Line heading.

Slovenia - SO
Generally speaking, Slovenes are reluctant to relocate and thus inter-regional migration remains low. The relative concentration of researchers in the public research sector versus the business R&D departments is a recognized growth impediment. In order to address the issue, the Ministry of Science and Technology subsidises organisations (enterprises) developing technologies by covering [SO_1]:

- part of the salary for the newly employed Ph.D. and M.Sc. graduates in enterprises,
- costs (salaries and other costs related to tutorship) for young R&D personnel preparing their M.Sc. and Ph.D. theses in co-operation with a research or university organisation, who are employed in enterprises.

In addition to those measures, instruments are being introduced which cover the co-financing of post-graduate programmes and covering a part of the scholarships for post-graduate study. However, the consensus is that while a researcher's salary differential among the public and private sector remains in favour of public entities, the impact of the above measures will remain limited.

5.5. Longevity of Policy Measures

The number refers to the policy measure reference in the datasheets (e.g. AT_19)
The start date is shown by the policy measure code in **Bold**
The end date is shown in normal font
The letter **a** after a **bold** datasheet reference indicates the policy was amended

Country Code	**START & END (YEAR)**														
	<80	**<90**	**<95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**	**03**	**04**	**05**	**06**	
AT			**20**		**19** **22** **23**	 **24**	 **27**	19 20			22		23	 27	AT
BE			 **27** **36** **43**		 **24**	**18** **20**	 **37** **39** **47**		18 20	 47					
DE **26?** **29?** **41?**			 **43**	**25**		**21**	 **27** **52**	 **36** **51**	21					25 52	DE
ES	**01**		 **07** **08**	 **10**	 **06** **09**		06 09	 **12** **13** **14** **15** **16** **17** **19** **20**			 12 13 14 15 16 17 20				ES
FI		**01**	**05**				**10**		10					05	FI
FR **27**						**17**	**12**	 **28**							FR
GR **26**					**16**	 **17** **19**		16							GR
IE		**22**	**23**	 **24**											IE
IT			 **04** **05**		**01** **02** **03** **07**	 **08**									IT

		18					**11** **15** **23** **32** **33**	 23 **25** **26**						25	
NL		 **31**			**01** **07** **13** **14**	 **18** **19** **29**								 19	NL
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PT			**01** **02** **09** **10**		**07**		01 02 07 09 10								PT
SE **11?**		**02**	**01** **04** **06**	 **07** **09**				06		09				04	SE
UK	**18**		**01** **20**	 **29**		 **22**	 **19** **21** **23** **37**	**18a** 19 **34**	01 21		 **22**				UK
	<80	**<90**	**<95**	**96**	**97**	**98**	**99**	**00**	**01**	**02**	**03**	**04**	**05**	**06**	