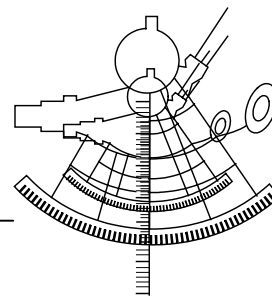


European Trend Chart on Innovation

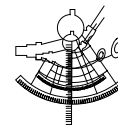


Thematic Report:

Progress towards the objectives set out in the European Commission Communication on *Innovation in a Knowledge-Driven Economy*

Covering period to March 2002





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 Enterprise, 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:

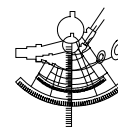
- a database of policy measures across Europe;
- a 'who is who?' of agencies and government departments involved in innovation;
- a series of six-monthly country reports for all countries covered;
- a series of six-monthly trend reports covered on each of the four main themes;
- a number of benchmarking reports;
- the European Innovation Scoreboard and other statistical reports;
- a news service and thematic papers;
- the annual reports of the Trend Chart.

The present report was prepared by **Paul Cunningham, Khaleel Malik, Gloria Baretto, and Elvira Uyerra, PREST, University of Manchester**, from a draft prepared by **John Clifford and Jean-Christophe de Tausia, INBIS Ltd**. 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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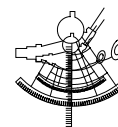
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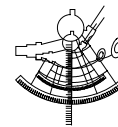


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Progress towards the objectives set out in the European Commission Communication on *Innovation in a Knowledge-Driven Economy*

1. Introduction

In 2000, the European Commission issued a Communication on *Innovation in a knowledge-driven economy*, COM(2000)567 final. Within this document, five objectives were presented, aimed at strengthening Member States' capacity to overcome obstacles to a more innovation-enhancing environment. Under each objective, Member States were tasked with a specific list of actions (see below).

Objective 1: Coherence of innovation policies

- National and regional innovation policies should take account of '**best practices**' and adapt them to their specific environment.
- Ensure that **coordination mechanisms** are in place between national and regional levels, and between different departments responsible for matters relevant to innovation, so as to guarantee a coherent approach to innovation policy.
- Implement **periodic target-setting, monitoring, evaluation and peer review** of regional and national programmes for enhancing innovation and of the bodies which implement them.

Objective 2: A regulatory framework conducive to innovation

- **Adapt the rules for the diffusion of research results from publicly funded research** (licensing, access to foreground knowledge, etc), to encourage exploitation and transfer of results so as to foster innovation.
- Put in place **fiscal measures**, in accordance with Articles 87 and 88 of the Treaty, to encourage private investment in research and innovation and employment of researchers by the private sector.

Objective 3: Encourage the creation and growth of innovative enterprises

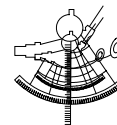
- Pursue efforts to create a **legal, fiscal and financial environment favourable to the creation and development of start-ups**.
- Foster, at regional level, the **creation or reinforcement of adequate support services and structures such as incubators, etc**.
- Set up **education and training schemes in entrepreneurship and innovation management**, where these do not exist, in higher-education establishments and business schools, and disseminate good practice in this area.

Objective 4: Improve key interfaces in the innovation system

- Stimulate and coordinate **regional initiatives and regional actors** to devise and implement integrated research and innovation programmes at regional level.
- Facilitate the implementation of **lifelong learning** programmes to improve the general assimilation of new technologies and remedy shortages of skills.

Objective 5: A society open to innovation

- Encourage comprehensive '**stakeholder**' **debates on innovation** involving scientists, industry, consumers and public authorities.

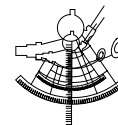


- Stimulate public demand for innovation by **dynamic purchasing policies in public administrations.**

This report provides an analysis of the situation as at the end of March 2002, some eighteen months after the Communication was issued, in both the Member States of the EU and the Candidate Countries in Central and Eastern Europe.

The report covers the impact of the Communication on the innovation policies of the countries and the progress that the countries have made towards the achievement of the objectives set out in the Communication. It also indicates those areas in which the Commission may be able to take actions at a European level to assist both current and future member states in their achievement of the objectives set out in the Communication.

The analysis is based on the results presented in response to a series of questions based on the actions listed in the Communication by the network of Innovation Correspondents under Lot 1 of the Trend Chart project. The following sections of this report are structured according to the five Objectives provided in the Commission Communication, preceded by a general overview of progress towards the objectives. The final section offers a set of conclusions arising from the study.



2. Overall progress towards the objectives

2.1 Impact of the Communication

When discussing the impact of the Communication, it should be borne in mind that the intention of the Commission was not to create a major impact directly. The Communication formed part of a wider process of encouraging and fostering innovation throughout the European Union and was more a formalisation of some of the results of the March 2000 Lisbon Council rather than a stand-alone document.

It is also important to note that innovation policy changes over long time scales, and the effect of changes in policy can also take a considerable time to become apparent. It would be wrong, therefore, to expect any radical changes in policy direction within the eighteen or so months since the Communication's publication, and any effects arising from policies instituted during this period may not yet be showing any discernible results. Furthermore, as will be demonstrated, a number of the countries reviewed had already begun to make – in some cases substantial – progress towards the innovation policy developments prescribed by the Commission's Communication. Thus this report does not seek to ascribe any such progress to the Communication, but forms a stocktaking exercise of the current situation.

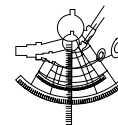
Impact can occur at three levels, with increasing specificity:

1. Changing the way of thinking of policy makers, where innovation has a lower priority than might be desirable, and bringing innovation up the priority scale
2. Pointing out the need for new policy measures to address identified deficits in the policy framework, leading to increased policy activity (though this may not yet have resulted in any specific actions)
3. Providing the catalyst for specific new policy initiatives with defined actions and targets. Such initiatives may or may not have resulted in any visible change in the timeframe under review.

Within the Member States and Associated States¹ in general, the direct impact of the Communication has been low, though noticeable. Few policy documents make explicit mention of the Communication. Nevertheless, the broader 'Lisbon process', which embraces the general intent of the Communication and of which the Communication forms part, is often identified in Government policy declarations, providing a framework for innovation and technology policy in particular.

- Leading innovative member states (such as Germany, the Netherlands, Sweden and the UK) note that existing policies are closely aligned with the content and objectives of the Communication and, in several cases, have been so for a number of years. For example, the Irish National Development Plan for 2000-2006, which pre-dates the Communication, already included most of the outcomes of the Communication (with a few exceptions such as the dynamic public purchasing policy).
- There is some strong circumstantial evidence that the Communication has had an influence on policy makers. For example, in France where the Communication has been quoted by, amongst others, ANVAR and the Ministry for Finance. In Finland, the Communication is reported to be well known amongst policy makers and has been used as background material, alongside other relevant information sources, for innovation policy decision-making. In the Netherlands, the importance of the Communication has been acknowledged in a letter to parliament from the Minister of Economic Affairs, in which she describes what measures she will take to improve the effectiveness of Dutch innovation policy.

¹ In this case, taken to include Norway, Liechtenstein, Israel and Iceland.



- Greatest impact has been amongst some of the 'lagging' Member States. For example, the impact has been very strong in Portugal, and the Communication has been instrumental in the launch of a programme specifically focussed on innovation – the Integrated Programme on Innovation (PROINOV), which explicitly acknowledges the influence of the Lisbon Strategy on its design and inception. In Italy the Communication has influenced the framework of the new structural policies, and the Communication's recommendations can be seen to have influenced the elaboration of the programming document for the Operational Programme 'Research' and the drafting of the regional plans for R&D and Innovation and for the Information Society. As a consequence of the publication of the Communication, Luxembourg has implemented a number of measures that address its objectives (including the creation of an innovation observatory, and its cluster programme to promote co-operation between enterprises).

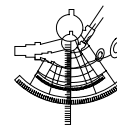
In the Candidate Countries², innovation in many cases is a low policy priority and other economic areas are deemed to be more pressing, e.g. social issues, poverty, unemployment, etc. Nevertheless, there was evidence of clear impact in:

- Bulgaria (policy makers are following the Communication recommendations);
- Cyprus (New Industrial Policy measure for incubators and creation of the Centre for Technology Research and Development are in agreement with the philosophy of the Communication);
- Estonia (through links and influence of the Finland system);
- Hungary (Scientific and Technology Policy 2000);
- Poland (Communication widely available at Central administrations);
- Romania (for example creation of the National Guarantee Fund);
- and Slovenia (stated in policies and programmes).

Although no specific references were made, awareness of the Communication is being developed in Latvia and Lithuania. Lastly, reports from the Czech and Slovak Republics indicate that it had a negligible impact.

In both groups of countries (EU and CC), the impact has mainly been at levels 1 (changing the way of thinking of policy makers) and 2 (pointing out the need for new policy measures) on the scale above. The effect is likely to be seen more clearly in the next two to three years, as policies which have been debated and developed start to be implemented and show some results.

² For the purposes of this report, the Candidate Countries comprise Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia; Malta and Turkey are not represented within the Trend Chart network as yet.



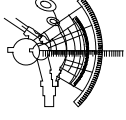
2.2 Policy developments since the Communication's publication

To help identify priority actions undertaken by Governments since the publication of the Communication in September 2000, members of the Network of Innovation Correspondents were asked to give their (admittedly subjective) view on whether activities related to each line of the table had increased, decreased or remained the same since the publication of the Commission Communication. Correspondents were also asked to indicate where it was not possible to make an assessment.

The following tables (Tables 1 and 2) summarise the perceived developments of national policy actions since the publication of the Communication in September 2000. The trend assessment is highly subjective and no national policy actions can be assumed to be linked to the Communication, except in cases where specific reference to it has been made. It should also be noted that the baseline from which any 'progress' was made has not been examined. As noted above, a number of countries have already implemented measures along the lines set out in the recommendations contained in the Communication. Thus it is not possible to make any meaningful comparisons between countries.

Overall, the Member States and Associated States report a stable situation with regard to progress against the Communication objectives in half (50%) of the possible cases, with a slightly lower proportion (44% of possible cases) showing that innovation policy activity has increased in the relevant areas. Only in 2% of cases was a decrease reported. Since many countries report that initiatives were in place prior to the publication of the Communication, this appears to indicate that there is a strong trend in innovation policy along the lines set out in the Commission's recommendations.

A similar general picture also emerges with regard to the Candidate Countries. Again approximately half (51%) of possible cases present a stable situation. Progress was reported in 43% of the possible cases. Again, the incidence of decrease in activity was very low at 3% of possible cases. Thus it appears that there is also strong progress towards the Communication objectives in the Candidate Countries, although it is suspected that this is taking place from a lower baseline.



European Trend Chart on Innovation

Table 1. Trend assessment of progress towards Commission Communication

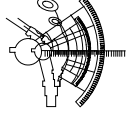
Objectives: Member States and Associated States

Priority actions	A	B	Bru.*	Fla.*	Wal.*	DK	FIN	F	D	GR	IRL	I	L	NL	NO	P	E	S	UK
Objective 1: Coherence of innovation policies																			
1.1. Best practice in innovation policies	+	=	=	=	=	=	=	=	+	+	-	=	+	=	+	+	=	+	=
1.2. Innovation policy coordination mechanisms	=	+	+	+	+	+	=	=	=	=	=	+	=	+	+	+	=	+	+
1.3. Monitoring and evaluation of innovation support	+	=	=	+	+	=	=/+	+	+	=	=	+	+	+	=	=	=	+	=
Objective 2: A regulatory framework conducive to innovation																			
2.1. Diffusion of results from publicly funded research	=	=	+	=	=	+	+	=	+	=	=	+	=	=	+	+	+	=	+
2.2. Fiscal measures to encourage innovation	+	-	N/A	N/A	N/A	=	=	=	=	+	=	+	=	=	+	+	+	=	+
Objective 3: Encourage creation and growth of innov. enterprises																			
3.1. Favouring the creation and development of start-ups	+	=	+	=	+	=	+	+	+	+	=	+	+	+	=	+	+	-	=
3.2 Innovation support structures and services	=	N/A	=	=	=	=	+	=	=	+	+	=	+	=	-	=	+	=	=
3.3 Training in entrepreneurship and innovation management	=	N/A	=	=	=	=	+	=	+	=	+	=	+	+	=	+	+	=	=
Objective 4: Improving key interfaces																			
4.1 Innovation at the regional level	+	N/A	+	+	+	+	+	=	+	+	+	+	=	+	=	+	=	+	=
4.2 Lifelong learning	+	N/A	=	+	=	+	=	+	+	+	-	=	+	+	=	=	+	+	+
4.3 New missions for universities	+	N/A	=	+	=	+	+	=	+	=	+	=	=	=	+	=	+	+	=
4.4 Technology transfer by large public research facilities	+	=	=	=	=	=	=	=	+	=	N/A	=	=	=	=	=	=	=	=
Objective 5: A society open to innovation																			
5.1 Stakeholder debates on innovation	+	=	=	=	=	=	=	+	+	=	=	=	+	=	+	+	=	+	=
5.2 Public administration purchasing policies	=	=	=	=	=	=	=	=	=	=	N/A	=	+	=	?	=	=	=	+

Key:

- + increasing;
- = stable;
- decreasing;
- N/A not applicable (to national context);
- ? unknown.

For analytical purposes, N/A results for Belgium at the federal level are assumed to mirror the most positive 'regional' result.



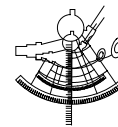
European Trend Chart on Innovation

Table 2. Trend assessment of progress towards Commission Communication Objectives: Candidate Countries

Priority actions	Cyprus	Bulgaria	Czech Rep.	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia
Objective 1: Coherence of innovation policies											
1.1. Best practice in innovation policies	=	+	=	=	=	=	=	+	=	=	+
1.2. Innovation policy coordination mechanisms	=	=	=	+	+	+	=	+	+	=	=
1.3. Monitoring and evaluation of innovation support	+	=	=	+	+	+	=	-	=	=	=
Objective 2: A regulatory framework conducive to innovation											
2.1. Diffusion of results from publicly funded research	=	=	+	+	N/A	=	=	=	=	+	=
2.2. Fiscal measures to encourage innovation	-	+	=	+	+	+	+	-	=	=	=
Objective 3: Encourage creation and growth of innovative enterprises											
3.1. Favoured the creation and development of start-ups	+	=	+	+	+	+	=	+	+	+	+
3.2 Innovation support structures and services	+	+	=	+	=	+	=	-	+	=	=
3.3 Training in entrepreneurship and innovation management	=	=	+	+	N/A	+	=	=	+	=	+
Objective 4: Improving key interfaces											
4.1 Innovation at the regional level	=	+	=	+	+	+	=	+	+	=	=
4.2 Lifelong learning	+	+	+	+	=	+	+	+	=	+	=
4.3 New missions for universities	+	+	=	+	+	+	=	=	=	=	=
4.4 Technology transfer by large public research facilities	=	=	=	+	N/A	+	=	=	=	=	=
Objective 5: A society open to innovation											
5.1 Stakeholder debates on innovation	+	+	=	=	=	=	=	=	+	=	+
5.2 Public administration purchasing policies	+	=	=	N/A	=	=	=	=	+	=	=

Key:

- + increasing;
- = stable;
- decreasing;
- N/A not applicable (to national context);
- ? unknown.



2.3 Indications of progress

The following sections provide more specific indications of progress with regard to the actions recommended in the Commission Communication.

Objective 1: Coherence of innovation policies

Action 1.1: Best practice in innovation policies

From Table 1, it can be seen that seven of the Member States and Associate State countries (Austria, Germany, Greece, Luxembourg, Norway, Portugal and Sweden) report an increase in activities of this particular Action line since the publication of the Communication. With the exception of Ireland (which reports a decline in activity), the remaining countries activities have been stable. From Table 2, it can be seen that three of the Candidate Countries (Slovenia, Poland and Bulgaria) report an increase in activities of this particular Action line since the publication of the Communication. All the remainder of the Candidate Countries activities have been reported to be stable for this Action line.

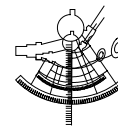
Most Governments do not appear to have a specific policy on monitoring 'best practice' in innovation policy, which makes it difficult to identify precise examples where national Governments take account of best practices in innovation policy. On an international level, learning from good practice, which might be taken into account informally, is not undertaken as a systematic task in most countries: most monitoring activities are usually undertaken on an *ad hoc* basis (as confirmed and described in the report *Transnational Learning in Innovation Policy*³).

However, given that the impact of the Communication can occur at the level of changing the way of thinking of policy makers and increasing the policy priority of innovation, there is evidence of good 'general awareness' of best practices from other countries and from external reports commissioned by the European Commission and OECD, for example (see Malik *et al.*, *op. cit.*). One good example that illustrates how policy makers are examining innovation policy-related issues by monitoring practices in other countries is through the use of tax credits or fiscal incentives to stimulate R&D spending, and in this context information is collected on best international practices. Evidence of this type of information collection is highlighted in a number of countries including Greece, Germany, Ireland, France, Portugal and UK.

In France two ministries at the national level manage the innovation system: the Ministry of Research and the Ministry of Economy, Finance and Industry (MEFI). These ministries ensure the coordination mechanisms with the regions via their regional representations.

Only a few examples are given where Governments transfer best practices from one region to another. In Germany regional approaches to technology development and R&D co-operation have proved to be effective and this experience has prompted various other new programmes. For example, the successful experience of BioRegio (DE 52) was used to design the Regional Innovative Growth Poles (DE 57), NEMO (DE 75) and Learning Regions (DE 53) programmes. In Italy the central Government maintains a process of monitoring and transferring best practices from one region to another. In Hungary some pilot programmes have been launched to support R&D activities in SMEs in the three less developed regions, which are coordinated by the Chamber of Commerce in each region.

³ The issue of 'policy learning' between countries is explored more fully in Malik, K., Barreto, G. and Cunningham, P. European TREND CHART on Innovation, Thematic Report: *Transnational learning in innovation policy, Covering period: October 2001 – April 2002*



Action 1.2: Innovation policy coordination mechanisms

Table 1 shows that eight of the Member States and Associate State countries (Belgium, Denmark, Italy, Netherlands, Norway, Portugal, Sweden and UK) report an increase in activities of this particular Action line since the publication of the Commission's Communication. The remaining countries' activities are reported as stable. From Table 2, it can be seen that five of the Candidate Countries (Estonia, Hungary, Latvia, Poland and Romania) report an increase in activities of this particular Action. The remainder report a stable situation.

National and regional innovation coordination mechanisms

This section presents an illustrative range of typical innovation coordination mechanisms that are currently in place between national and regional levels:

The Italian Minister of Innovation and New Technologies and the President of the Regional Presidents' Conferences have recently signed an agreement for the establishment of a Permanent Commission on innovation and technologies. This co-operation will focus on a number of issues, including projects like 'e-Government', both in relationship to infrastructure and services

In Spain, there has been growing concern about actions relevant to innovation in different Autonomous Communities. In order to coordinate activities between these regional communities and the central administration, the General Council of Science and Technology has been created. Its functions include encouraging the exchange of information between central administration and the autonomous communities, in relation to research programmes, to promote general coordination in scientific and technical research.

The Swedish Government introduced a regional development bill in 2001 of relevance to the future development of the Regional Government Agreements. The aim is to establish a well-coordinated policy for all parts of the country, i.e. to create regions with well-functioning and sustainable local labour markets and with good services. This is a major change in regional policy. These bodies will have the authority to make decisions on plans for regional infrastructures and will be able to make decisions on some Governmental funds for regional development.

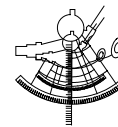
In the UK, the existence of regional Government Offices (which cover all aspects of Government business, including innovation) and the more recent establishment of the Regional Development Agencies (which focus more specifically on innovation-related issues and activities) are mechanisms that aim to ensure coordination between the national and regional levels. Furthermore, a national network of Business Links offices provides a coherent delivery of business support measures across the country.

The federal system in Germany imposes a division of labour between the Federal and the *Länder* Governments in all policy areas, including innovation policy, as both the Federal Parliament and the *Länder* Parliaments are legislators and both operate innovation policy instruments. Coordination takes place through several mechanisms. In the field of innovation and technology policy, the *Bund-Länder-Ausschuss* (Federal and *Länder* Committee) on Innovation and Technology Policy offers a forum for exchanging information and experiences among policy actors.

Coordination arrangements and a coherent approach to innovation policy

Some typical examples that illustrate the implementation of coordination arrangements in a number of countries are presented below.

In Portugal, the launch of PROINOV (Integrated Programme to Support Innovation) placed the coordination of innovation policy at Prime Ministerial level. This was done to ensure inter-departmental collaboration and to leverage the impact of the envisaged policy. This is in recognition of the fact that innovation policy is a critical element for socio-economic development, linked not just to industrial,



enterprise and science and technology policies, but also to education, employment and labour markets, territorial development and reform of public administrations.

In Germany, responsibility for innovation policy within the federal Government is mainly divided between the BMBF (Federal Ministry of Education & Research) and the BMWi (Federal Ministry of Economics and Technology). Co-operation between the ministries has significantly increased and several key policy papers were jointly authored by the two ministries (e.g. *Knowledge Creates Markets* and *Information Society Germany*). Jointly published brochures present the various innovation promotion measures, including all relevant programmes run by the *Länder* Governments.

Dutch policy coordination has also resulted in the joint preparation of White Papers. *The Dutch Digital Delta – The Netherlands oN-Line White Paper* (1999) was developed by the Ministry of Economic Affairs and the Ministries of Large Cities and Integration Policy, of Justice, of Education, Culture and Science, and of Finance. It offers a framework for – and reflects consistency in – the Government's initiatives and activities in the field of ICT. Similarly, the Dutch Government has developed an integrated policy on biotechnology. Six ministries were involved in the preparation of the *Integral White Paper on Biotechnology*.

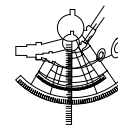
One example of recent coordination in Belgium was the initiative of the CFS/STAT group (a group of officials coordinating work on R&D and innovation statistics and indicators), which resulted in the Belgium Report on Science, Technology and Innovation (BRISTI) in 2001. One of the report's aims was to help interested parties from other European countries form a picture of the Belgian scientific and technological landscape.

In the UK, the Department of Trade & Industry (DTI) takes the lead role, both in terms of delivering the Government's priorities for innovation and in ensuring cross-Departmental cohesion in matters of innovation policy. To ensure coordination, the Department is represented, often at a senior level (for example, by the Secretary of State for Trade and Industry) on a wide range of inter-Departmental committees and advisory bodies.

Increasing role of science and technology councils

A number of countries have created specialist councils to promote the greater participation of society in R&D policy. For example, the Spanish 'Advisory Council for Science and Technology' encourages the scientific community, economic and social agents in Spain to participate in the preparation and evaluation of innovation policy. This has also led to the signing of specific agreements in Spain between the Government and the regions which open the way to establishing common priorities on RTD and innovation. The Science and Technology Policy Council of Finland has a visible role in the coordination of innovation policy activities at national level. This Council is led by the Prime Minister and has members from both Government and key stakeholder organisations. In addition, the key innovation policy agencies, Tekes and the Academy of Finland, have close ties and coordinate their activities continuously.

Recently, Denmark has shifted policy areas relating to innovation from the Ministry of Economic and Business Affairs to the Ministry of Science, Technology and Innovation, a move that is expected to improve coordination of policy. In addition, the creation of an advisory board to the Minister for Science, Technology and Innovation (the Council for Technology and Innovation), under the recent Act on Technology and Innovation, is expected to improve the coordination of innovation policy even more.



In Latvia, progress along this action line made when the Government announced its intention to set up a Coordination Council for the National Programme on Innovation. This will consist of representatives from different institutions involved in the programme: science, industrial associations and representatives from organisations dealing with support for innovation. The main tasks of the Council will be to:

- evaluate the draft of the National Programme on Innovation,
- review the draft of legal acts pertaining the implementation of the programme; and
- evaluate the feasibility of meeting the goals as outlined in the programme.

In Romania, the Ministry of Education and Research (MER) has two departments, the Department of Education and the Department of Research. Four consultative councils for research report to the MER. These are:

- Inter-ministerial council for atomic energy;
- Inter-ministerial council for science, technology and innovation;
- Inter-ministerial council for quality infrastructure and technical regulations;
- Consultative college for research, development and innovation and National Council of Scientific Research in Higher Education Domain.

Challenges facing innovation policy coordination

A few countries are facing some practical challenges in the coordination of innovation policy that need to be highlighted here. In the Netherlands, for example, although some joint White Papers have been developed by a number of Ministries to coordinate efforts between them, in practice little evidence has emerged of any coordinated instruments for innovation policy. Similarly, the fragmentation of Austrian technology policy through the division of competencies between three ministries is seen to present a number of problems. For example, the coordination of technology and innovation policy strategies by the Austrian Council for Research and Technology is limited to the approval of the additional funds allocated to achieve R&D spending of 2.5% of GDP by 2005.

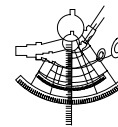
In the Candidate Countries, a number of practical challenges in innovation policy coordination have to be faced. For example, in Bulgaria, there are no coordination mechanisms due to the fact that there is no distinct innovation policy with designated institutions responsible for its implementation. In Cyprus, a recent study on innovation policy⁴ stressed that the Cypriot innovation system is characterised by its fragmented nature and the lack of integration and coherence between its different parts. Although it possesses a rich institutional setting, it lacks sufficient policy delivery procedures – including the process of decision-making itself – and is burdened by an inefficient public sector which is often set at a disadvantage by its own structure of operation and the various conflicting lobbies that participate in the policy making process.

Action 1.3: Monitoring and evaluation of innovation support

An examination of Table 1 indicates that nine of the **Member States and Associate State countries** (Austria, Belgium (Flanders), Finland, France, Germany, Italy, Luxembourg, Netherlands and Sweden) have reported an increase in activities along this particular Action line. The remaining countries' activities have been reported as stable. From Table 2, it can be seen that four of the Candidate Countries (Cyprus, Estonia, Hungary and Latvia) have reported an increase in activities. All

⁴ Musyck, B., Georgiou S., Christodoulides G., Hadjimanolis A., Antoniadis A. (2001) *Innovation Policy in the Six Candidate Countries: The Challenges – Innovation Policy Profile: Cyprus*, study commissioned by the DG for Enterprise – European Commission:

ftp://ftp.cordis.lu/pub/innovation-smes/docs/f_studies_6_candidate_countries_cyprus_report_en_2001.pdf



the remainder of the Candidate Countries' activities have been reported to be stable, apart from those in Poland, which show some decline in this area.

For several years the use of assessment, monitoring, evaluation and related activities has been broadly accepted, although to differing degrees, throughout most of the European member and associate states, and has been progressively developed to meet changing needs and pressures. However, for a number of Candidate Countries it is too early to assess results of any periodic monitoring and evaluation type activities.

All Portuguese Operational Programmes that relate to innovation policy include *ex-post* evaluation mechanisms to assess performance levels, not only in terms of cost-benefit analysis, but also as learning processes to enable improvements in future policy making exercises.

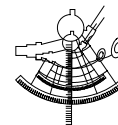
Likewise in Germany, almost all innovation policy programmes run by the Federal Government are accompanied by a monitoring system, and many undergo at least some kind of evaluation. In 2001 a comprehensive evaluation of the following R&D support programmes was undertaken (designed as a 'systematic evaluation'):

- Promotion of Joint Industrial Research (DE 17);
- Future technologies for SMEs - ZUTECH (DE 54);
- 'Grants for R&D in SMEs in Eastern Germany' (DE 19);
- ProInno (DE 28); and
- The InnoNet (DE 26) programme.

In the UK any proposals for new innovation programmes (costing over €1.64 million) in the Department of Trade and Industry (DTI) must be accompanied by a ROAME statement. This specifies the **R**ationale, **O**bjectives, **A**ppraisal, **M**onitoring and **E**valuation elements associated, in an iterative process, with the programme. Before proceeding, the ROAME statement must be approved by the Individual Programme Committee and the DTI minister. Recently, the approach has been modified to ROAME-F to include the **F**eedback process, which is important for disseminating the results of evaluations, and for incorporating the lessons learned at the early stages of other programmes.

The evaluation of measures and programmes has always been important to VINNOVA and its predecessors in Sweden. However, the content of these evaluations are in the process of being broadened. Most of the programmes concern research at Universities which is oriented towards the needs of industry. Hitherto, scientific quality was the only aspect of the programmes evaluated. While still important, in future the impact on industry and economic growth will be just as important in programme evaluations. Other kinds of measures outside R&D programmes will also be evaluated in terms of their impact on economic growth. Similarly, Finland has a lively policy evaluation culture, and has been using benchmarking intensively for several years. Public innovation support measures, and also the public bodies responsible for their implementation, are under extensive review and evaluation. The ministries involved in innovation policy making have commissioned a considerable number of evaluations in recent years. The evaluation of public appropriations for research (FI 07) and various evaluations of national cluster programmes belong to this category. In the field of innovation policy, Tekes (the National Technology Agency) commissions most of the evaluations. At the end of the 1980s, Tekes made a decision to evaluate all its technology programmes. Since then, over 60 Tekes technology programmes have been evaluated by experts. In Norway, the Research Council actively evaluates programmes and instruments. There is also a special 'Evaluation Forum' with members from the Research Council, SND, ministries and so on.

In Italy, some ministries have set up 'observatories' which give advice on technical aspects, monitor the results of current policies and provide guidelines for the future. For example, the 'permanent observatory on e-commerce' has pursued the goal of opening up e-commerce to SMEs through various *ad hoc* measures. It monitors the evolution of the economic and productive system,



identifies constraints and barriers to the use of new technologies among enterprises (particularly SMEs), public agencies and consumers, promotes action to overcome such obstacles and proposes measures and direct action – possibly legislative or regulatory – to develop e-commerce. Likewise, in Luxembourg the creation of the innovation observatory constitutes the main monitoring and evaluation tool for current and future innovation policies. Its activity mainly consists in monitoring and evaluating what exists abroad and identifying the new projects in progress. It also focuses this activity on the domestic market.

The use of monitoring and evaluation as instruments for improving policy design, management and implementation remains a relatively recent (and still developing) priority in Belgium. There have been several recent positive steps towards the constitution of an evaluation community in Belgium, notably the creation of the Walloon Association for Evaluation and Prospective (*Société Wallonne d'Evaluation et de Prospective*, SWEPE). However, this has had no real influence to date on evaluations of innovation policy measures.

In Greece, evaluation of measures and policies is fragmented and *ad hoc*. Peer review is systematically applied for the *ex ante* evaluation of all proposals responding to public calls. In 2001 there was a second institutional evaluation of all research institutes supervised by the GSRT. Likewise, the implementation of periodic target-setting, monitoring, evaluation and peer-reviews of Danish innovation support programmes – or of the bodies implementing the same – is rather sporadic or *ad hoc*. However, many of the measures in place are quite recent and it has been stipulated that a number of them will be evaluated after a certain period of time. One recent example of a scheme that has been evaluated is the Industrial Research Scheme (DK 5); this evaluation was carried out by a private consulting firm and covered the period 1995-2000.

In Austria a general strategy toward *ex ante* goal setting and *ex post* evaluations has not yet materialised nor is any move in this direction discernible. Nonetheless, the research and technology ('fteval') platform (<http://www.fteval.at/>) is a non-partisan institution, which is trying to improve the Austrian evaluation culture. This body publishes a newsletter and organises presentations and discussions on these issues.

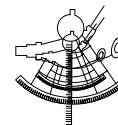
Although the Irish 'National Development Plan' (NDP) 2000-2006 sets out overall performance indicators for research, technological development and innovation (RTDI) measures, there is little evidence to suggest that Irish policy makers are prepared to engage in evaluation of innovation support programmes over and above that required by EU funding obligations.

For a number of the **Candidate Countries** it is either too early in their innovation policy areas for evaluations to have been conducted, or there are no statistical records to help undertake any meaningful monitoring and evaluation exercises.

Since 1999, Bulgaria has carried out assessments and evaluations of programmes or initiatives related to innovation policy performed by an academic group from the Academy of Sciences. This group also plans to carry out future appraisals. However, the Government has not taken up their recommendations, considering social problems such as poverty and unemployment to be more pressing issues affecting Bulgarian society.

The 'Statistical Service' in Cyprus supplies indicators only for R&D and there is no systematic collection of innovation indicators. Regarding evaluation, each agency undertakes evaluations for its own programmes (e.g. the RPF will soon launch an overall evaluation of its programmes and operation).

As all Estonian state programmes have recently been designed in the context of the reorganisation of the Estonian innovation system, only the SPINNO programme has been launched so far. Nevertheless, its evaluation is planned for 2003 and this should serve as a useful source of decision making for the programme's continuation in 2004.



The Statistics Department of Lithuania is responsible for preparing studies on the development of its innovation activities in order to estimate trends in innovation development and their impact on business. Examples include the Survey of the Lithuanian Economy (May 2001), from which the Statistics department has published a report in the field of SMEs, covering the activities of business incubators. The Statistics department has also conducted research on innovation activities for the period of 1999–2000. Similarly, in Slovenia, annual surveys have been completed on individual innovation projects, from 1996 through 2000. However, a survey for 2001 was not carried out due to a lack of financial resources. An survey is scheduled for 2002.

In Latvia, the Government is mainly concerned with creating an initial innovative system, which would allow for the implementation of programmes related to innovative activity. Likewise, in the Czech Republic and in Slovakia there are no official evaluation programmes, neither have any officials or administrators been appointed for handling innovation-related matters. The Government has not formulated any explicit policy on innovation.

Objective 2: A regulatory framework conducive to innovation

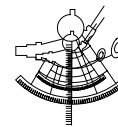
Action 2.1: Diffusion of results from publicly funded research

From Table 1, it can be seen that nine of the **Member State and Associate State** countries (Belgium (Brussels-Region), Denmark, Finland, Germany, Italy, Norway, Portugal, Spain and the UK) report an increase in activity in this particular Action line since the publication of the Communication. The remainder report a stable situation.

While there is no easily identifiable common characteristic to link these countries, it is also noticeable that the types of measures adopted to achieve this goal (diffusion of results from publicly funded research) vary considerably by target and mode of action. The following main types of initiative can be observed:

- project-based co-operation,
- IPR handling and framework arrangements,
- IPR regulatory reform,
- institutional reform,
- financial support,
- financial assistance for start-ups,
- innovative networks support,
- entrepreneurial awareness raising,
- mobility schemes,
- co-operation liaison support,
- direct diffusion of the results of public research via Government.

Examples of measures within these various categories are provided below. Some countries also have high-level initiatives that may include or influence several measures of this type, such as the German Federal Government's 'Knowledge Creates Markets' action programme. Similarly in Italy, the ordinary laws in these fields have been strengthened by a new initiative provided by the new CSF 2000-2006 for the Mezzogiorno and in particular, by the National Operational Programme 'Research' and by the seven Regional Plans. In France, the innovation law of 1999 introduced a series of new modalities and possibilities for co-operation between enterprises and public research agents, higher education institutes and other public research services.



Project based co-operation

This approach includes the Portuguese POCTI and POSI measures on R&D by consortia (PT 21), and the Mobilising Programmes on Technological Development (PT 23). At a more general level, activities under the PROINOV initiative are also concerned with innovation diffusion support. In Greece, a variety of measures stimulate diffusion via co-operation, such as the PAVET-NE (GR 08) programme, although no recent progress was reported. Belgium has also been active for some time in the provision of support for this type of mechanism (see Action 4.3). With regard to the diffusion of the results of university research, a number of schemes have existed in the UK for several years, and new developments have also been reported, including: LINK (UK 20), the Higher Education Innovation Fund –HEIF (UK 38), the Business Fellows Scheme (UK 51), a doubling of the number of Faraday Partnerships (UK 19), the University Challenge Fund (UK 11) and also the Regional Innovation Funds (UK 44). In addition, five University Innovation Centres have been established and New Technology Institutes are to be set up (two in each English region) and made operational by 2004. These will be based on partnerships between universities, colleges and local businesses.

IPR handling and framework arrangements

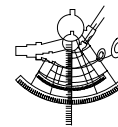
A number of countries have established mechanisms which promote or facilitate the utilisation of industrial property rights by a variety of actors. These include the Industrial Property Support Offices (GAPI) Network launched by Portugal's National Institute for Industrial Property (PT 26). During the 1990s, *Forskarpatent* (Patents and Licensing Offices) were set up at the major universities in Sweden to assist researchers in patenting and licensing processes.

IPR regulatory reform

This issue forms another innovation 'hot topic' and has attracted considerable attention. For example, the Belgian Federal Minister for Economy has his Governments' intention to improve the protection and exploitation of IPR in Belgium, and when selecting pre-competitive and industrial research projects for funding, all three regional Governments place priority on the potential for the exploitation of the research results in the economy or society of the region. More specifically, a number of measures have been implemented in Wallonia to increase the protection and commercialisation of research results. An important regulatory change took place in 1998, when the region decided to transfer the intellectual property of higher education research results carried out with the support of regional funds to the higher education institutes. However, no recent progress has been reported.

In terms of licensing regulations and intellectual property rights (IPR), an important change was recently introduced in Spain (February 2002) whereby researchers working in public research bodies are now able to obtain return benefits from their inventions from commercial exploitation. Luxembourg has recently modified its law on patents, thereby assisting SMEs and individual inventors. Hitherto, the Norwegian Research Council used the FORNY-programme (NO 11) as a vehicle for knowledge diffusion. More recently, the new Norwegian Government introduced a proposal to change its IPR law to increase industry's use of university and college inventions. In a similar way, IP regulations in Germany's higher education institutions have also recently undergone change (DE 59) – shifting the ownership of IP, while a new measure (DE 72) has been introduced to improve the infrastructure in both HEIs and PSREs for commercialising IP.

In Sweden, there has been ongoing discussion since the beginning of the 1990s on who should hold the IPR on the findings of university researchers. The current standpoint of the Government is to await evaluations of the Danish experience, where an Act on inventions at public research institutions came into force in January 2000. This ensures that universities, research hospitals, and Government Research Institutions (*Sektorforskningsinstitutter*) can take over the rights to inventions made by their employees and negotiate terms of rights with companies. The institutions are obliged to promote the commercial use of the inventions, and to make swift and professional assessment of any inventions made in the institutions. In support of these Danish efforts to build up institutional skills in patenting and



licensing and to promote the co-operation between research and business, five professional patent networks have also been established.

The area is also a major UK Government policy priority; moves to improve the diffusion of research results from publicly funded research pre-date the release of the Commission's Communication but continue to be delivered. Such measures include: publication of new guidelines on IP ownership and management for Government; changes to the Civil Service Management Code; and an awareness campaign.

Institutional reform

Germany has witnessed significant changes, particularly over the last two years, in the way that its large public research centres are operated and regulated. These changes include modification of institutional funding in the Helmholtz Association of German Research Centres and the (accomplished and prospective) merger of certain large research centres with the Fraunhofer-Society. Reform has also been instigated within Germany's higher education institutions (DE 59), in terms of both employment regulations and IP regulation. Likewise, in late 2001, the Spanish Government adopted a reform of the Science Law which affects researchers in public Research Bodies (such as CSIC, CIEMAT, ITGE, etc.). The effect is to broaden the range of research agents with whom they are able to co-operate, and to encourage researchers in the creation of spin-offs.

Other countries have opted to study the potential for institutional reform: Science Foundation Ireland and the Irish Council for Science, Technology and Innovation are currently undertaking research to identify best international practices in terms of developing a legislative framework for the commercialisation of research coming out of state-funded institutions. In Finland, in contrast to other EU-countries, IPR legislation allows university researchers the right to exploit the results themselves.

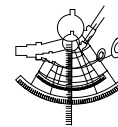
Financial support

In the UK, as part of a number of measures aimed at exploiting the results of research conducted in PSREs, a new fund for commercialising IP has been established. This aims to help bridge the gap in finance for seed investments, and targets PSREs (UK 52). The latter formed the cornerstone of an interdepartmental action plan, which sets out a range of measures to support PSREs in their mission to exploit the results of their work. A further scheme in the commercialisation of IP in universities and other publicly funded research organisations is the DTI's 'Biotechnology Exploitation Platform Challenge' (UK 37). More recently, in order to improve the availability of venture capital to start-ups from academia, the German BTU-programme was extended by a special measure, 'BTU Early Stage' (DE 66).

In Austria, the polytechnic sector is seen as a major instrument for technology transfer. Hence, the 'Fhplus' (AT 22) programme run by the Federal Ministry of Transport, Innovation and Technology aims to improve the research capacities of polytechnics. However, there are no reports of recent progress. At a broader level, in Luxembourg the creation of the 'National Research Fund' represents a new government step to strengthen the Luxembourg innovation policy. It also contributes to the development of technology transfer towards the private sector – with particular attention to SMEs (due to their weaker financial capacity).

Financial assistance for start-ups

A whole raft of measures has been introduced aimed at stimulating the creation and improving conditions for the development of start-ups. In Germany, for example, the long-established programme EXIST (DE 21) has been enlarged by another sub-programme, called EXIST Transfer, whilst start-up activities from PSREs are being supported through a new measure, the 'EEF-Fonds' (DE 74). In Greece, funding for academic spin-offs is provided through PRAXE (GR 39). Other measures addressing this objective are also dealt with under Action 3.1.



Innovative networks support

A number of measures address the creation and stimulation of regional networks of innovation and clusters. Examples include the 'Innovative Regional Growth Poles' (DE 57) set up in 2001 in order to foster industry-science co-operation in eastern Germany. There is also the NEMO programme (DE 75), a similar activity, but more focused on SMEs and their demand for support in innovation activities, and the Luxembourg pilot project 'Cluster programme' which is designed to assist companies in their R&D co-operation and technology transfer activities.

Entrepreneurial awareness raising

The importance of creating an entrepreneurial culture and overcoming the perceived prevalence of risk aversion amongst innovators has recently assumed greater importance. In Germany, a new measure called 'InWert' (DE 73) has been introduced within the INSTI network (DE 24), aimed at raising awareness among students concerning the commercialisation of inventions. Similar initiatives have been introduced in the UK (the 'Science Enterprise Centres' (UK 21, and the 'Enterprise Insight Campaign' (UK50)).

Mobility schemes

Belgium has a number of schemes in place which support the mobility of researchers between universities, research organisations and companies (see Action 4.3). Similarly, increasing the mobility of researchers between different sectors of the Spanish scientific and technological community is a priority for the MCYT. Two new programmes specifically address this priority: 'Ramón y Cajal' (ES 25) and 'Torres-Quevedo' (ES 30).

Many activities in this area pre-date the Commission Communication. For example the Swedish Government Research Bill 1996/97 stressed the need for new measures for supporting young researchers and their mobility. In the most recent Research Bill of 2000/01, the need for increased mobility between universities, university colleges and other parts of the labour market was stressed once again. In practical terms, as part of the interest in increasing mobility, new graduate research schools have been created over the years: Sixteen additional graduate research schools are foreseen in the Research Bill 2000 (SE 7).

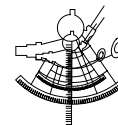
Co-operation liaison support

Initiatives under this heading include structures that promote interactions between the public and private sectors, either through direct support, brokering or via awareness raising. Several examples are available: in Portugal, the Lisboa and Tagus Valley Regional Programme (PT 28); in Greece, whilst there have been no recent changes in licensing regulations, the University Liaison Offices (GR 10), set up five years ago, have now received further funding.

Direct diffusion of the results of public research via Government

There are a number of ways in which governments may directly encourage or implement the diffusion of the results of public research. For instance, the French Ministry of Research uses several channels of communication to disseminate the results of public funded research, including brochures and studies.

With regard to the **Candidate Countries** (see Table 2), three (Czech Republic, Estonia and Slovakia) have reported an increase in activity along this Action line. These three countries could be considered to belong to the leading group in terms of innovation policy development within the Candidate Countries and therefore might be expected to be looking at ways of improving the dissemination of the results of their public research capacities. The remainder report a stable situation, although in the majority of cases this 'stability' actually reflects a relatively low level of co-operation and diffusion. Several states identify this aspect of innovation performance as being particularly weak.



With regard to those states in which progress can be observed, in the Czech Republic support is provided within programmes like PARK (for the establishment and development of scientific-technical parks), the TECHNOS project (directed towards supporting new technologies, materials and information systems) and the Konsorcja programme (which supports the establishment of teams formed by research institutions and the industry sector). All these programmes were designed for SMEs. In Estonia, perhaps the most significant programme is SPINNO, which was launched during the final months of 2001. The programme aims to promote the implementation of research results and it supports activities that contribute to the increase of entrepreneurship in universities and the development of a systemic higher education environment, which should promote entrepreneurial activities. The activities include the development of a regulatory framework, patent and license policy, promotion of the emergence of spin-off firms and their growth, including the creation of access to capital markets and co-operation networks with enterprises.

Although Lithuania reports no indications of new steps to intensify co-operation between research, universities and companies, several continuing initiatives (such as the Science and Technology Park, Innovation Centre of Kaunas Technology University and the Innovation Centre of Lithuania) are making a major contribution to intensifying co-operation between research, universities and business.

There are also indications that the situation in some countries will be improved in the near to medium future. For instance, although there are no specific schemes to help researchers at the University of Cyprus (or any other research institution in Cyprus) to valorise the results of their research in the private sector, some recent schemes of the Research Promotion Foundation (such as the 'Annual Programme of Financing of Research Projects' (CY 3) and the 'Programme for the Support of Young Researchers in Cyprus – PENEK (CY 20)) have established the participation of the *End User* (as in the 5th Framework Programme), a feature that increases the likelihood that results will be exploited. Likewise, in Slovakia the Strategy of the State Scientific and Technological Policy until 2005 has defined the main Research and Technology Development priorities and measures to identify the potential for co-operation between science and research, universities and the private sector.

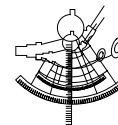
Action 2.2: Fiscal measures to encourage innovation

A review of Table 1 indicates that seven **Member State and Associate State** countries report an increase in activity along this particular Action (Austria, Greece, Italy, Norway, Portugal, Spain and the UK). With the exception of Belgium (which reports a decline in activity), the remaining countries activities have been stable. The situation in Belgium appears to reflect the fact that the main tax measures have been functioning since the early 1990s, and that, although new developments have been proposed in several recent policy documents, no concrete action has occurred and debate has even considered the elimination of fiscal incentives for investment in R&D.

Overall, there appears to be a dichotomy with regard to the use of fiscal incentives to encourage innovation between those countries that use them and those that do not. A secondary dichotomy is also found between the use of broad level tax concessions aimed to stimulate industry in general, and those which specifically reward R&D and innovation. A common trend appears to be the continuation of extensive debate over the issue of whether such measures should be adopted (in the case of countries not using them), or modified - or even discontinued (in the case of countries that do utilise them).

Countries using fiscal incentives

Fiscal incentives form the sole competence of the Federal Government in Belgium. The Federal Ministry of Finance manages all taxation measures in favour of R&D or innovation in enterprises. Two main measures have been functioning during the past decade: an increased rate of tax deduction for R&D investments (and patents acquisition) (BE 03); and a flat rate deduction from taxable profits for each additional member of personnel recruited to work on R&D (BE 04). More recently, as part of its October 2000 policy declaration, the Federal Government foresaw a number of measures in favour of 'the new economy' including a reform of company taxation. Moreover, a July 2000 Policy Note issued



by the Government Commissioner for Scientific Policy and the Minister for Economy and Scientific Research also proposed a series of amendments to the fiscal status of researchers in universities, as well as specific measures to reduce the fiscal burden on spin-off companies. However, the idea of reducing rates for innovative firms or spin-offs appears to have been shelved after the appearance of an April 2001 report by the Higher Council for Finance. This report recommended that reduced rates for SMEs should not be created, indeed suggesting that fiscal incentives for investment should be eliminated, including those for R&D. The Council's position appears to be strongly influenced by the need for Belgium to align its fiscal system with EU and international OECD obligations. However, the OSTC is currently considering a study to compare the types of fiscal incentives in neighbouring countries and their take-up rate, etc. by firms with a view to developing a debate on the most appropriate forms of fiscal support for research and innovation.

The Netherlands also has a relatively established fiscal instrument for the stimulation of R&D (the WBSO, *Wet Bevordering speur- en ontwikkelingswerk*) or tax Facility for R&D (NL 5), which was introduced in 1994. The WBSO is considered to be successful since it is relatively easily administered and therefore attractive to SMEs; moreover it has received a very high take-up rate. The scheme is currently being evaluated. At a broader level, the Netherlands has lowered the rate of corporation tax by 0.5% for the 2002 tax year.

Likewise, Austria has been offering an instrument of fiscal aid to R&D for some years. However, the R&D tax allowance is now felt to be showing some weaknesses and a reform of the measure has been designed. A new R&D tax allowance for R&D expenditure has been implemented, but at the price of increased complexity. Therefore, it has been suggested that fiscal aid for R&D should be made more transparent and that the new set of instruments be evaluated according to international standards after they have been in use for three years.

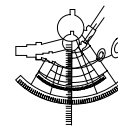
Italy operates a number of fiscal-based measures. In the two years since the Law No 140/97 (IT 7) on tax incentives for innovation came into force, there has been a very positive uptake by industry. In addition, the 2000-2006 National Operational Programme (NOP), Development of Local Entrepreneurship includes several measures to provide assistance to enterprises. These cover a range of investment activities by companies, including new plant, machinery, equipment and even network creation. Finally, the Government is hoping to stimulate the economy through its launch of a set of new detaxation rules regarding re-invested profits.

France also has a fairly long history of using fiscal incentives. In 1997 the French Government implemented a corporate tax credit for research expenses (CIR) measure (FR 5). In the same year it also created the Mutual Fund for Innovation (FCPI) (FR 10), and implemented particular measures such as SOFARIS (FR 9), intended to provide a guarantee to venture capitalists who make equity investments in higher risk or start-up business.

Luxembourg employs two main fiscal measures:

- 'tax relief' is a tax deduction measure aimed to stimulate the creation of new firms;
- 'degressive amortisation' aims to promote investment in materials and equipment.

Germany introduced a major tax reform (DE 14) in early 2001. Among other things, this reduces corporate taxes significantly both for large corporations and for SMEs. However, there are no special tax credits for costs or investment directly associated with R&D or innovation. Since 1992, financial support for R&D and innovation given by both Federal and the *Länder* Governments has rested on direct measures such as grants for R&D, and on loans, venture capital and re-financing opportunities. The rationale for shifting R&D and innovation support to direct financial measures rests on the conviction that this type of measure produces a higher level of additionality than fiscal measures, given the firm size structure of R&D and innovation expenditures in Germany (most R&D expenditure originates from very large companies). The feeling is that tax credits for R&D should thus be limited to SMEs. However, in recent months, a new debate on the introduction of fiscal measures to foster R&D and innovation has emerged.



In Portugal, there appears to be a trend towards using fiscal measures increasingly to support innovation, reducing the overwhelming reliance on financial incentives which has been the hallmark of Portuguese policy over the last 15 years. PROINOV tends towards this direction, and there are signs that the new Government will increase the use of tax credits. So far, the main measure in area is the revision of the Fiscal Incentives for Investment in R&D (PT 4).

Similarly, Spanish policy towards the promotion of private R&D and innovation expenditure relies on the combined use of direct government funding for business-performed innovation and fiscal incentives to reduce the cost of R&D investment. Moreover, Spanish fiscal regulation is operated as a horizontal instrument that seeks to stimulate innovation activity across the whole Spanish economy. Recent important developments in this area include the Law 6/2000 (December) on Urgent Fiscal Measures to stimulate family savings and SMEs, and the Law 24/2001 (December) of the Fiscal, Administrative and Social Measures Act, in which new modifications to Corporation Tax Law have been introduced. A new measure is planned for 2002 which will deal with the “technical accreditation of innovation”.

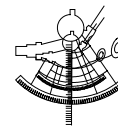
Although fiscal provisions exist in Greece stipulating that R&D expenditure must be written off in three years, this measure appears to be insufficiently used by Greek companies as they prefer grants to fiscal incentives. Nevertheless, the fiscal system has been further promoted through the new Law 2992/2002 on Entrepreneurship, which deals with mergers and acquisition and also the support of R&D. To date, however, venture capitalists prefer the support offered by TANEQ [GR 36], which matches venture capital funds, or PRAXE [GR 39], which directly funds spin-offs selected by venture capitalists.

The UK has become a fairly recent user of fiscal incentives for innovation support – hitherto policy was firmly against the use of such instruments. There are a now number of ongoing measures in this category such as: Capital Gains Tax (CGT) relief, enterprise management incentives, the tax credit scheme for small firms’ R&D (UK 35) and the All-Employees Share Scheme. All are operated by the Inland Revenue and are designed to “change the climate for investment across the economy, changing the risk/cost ratio for investment in research and development”. In the 2002 budget, it was announced that the Small Firms’ Tax Credit Scheme (UK 35) would be modified in order to encourage innovation by larger companies.

Lastly, Norway has recently introduced a new R&D tax incentive for SMEs – the *Skattefunn* (NO 32).

Countries not using fiscal incentives

With the recent exception of Norway (see above), generally speaking in the Nordic countries, fiscal instruments are not considered an important instrument to promote innovation. Thus in Sweden, tax incentives for R&D are not used and such incentives do not form an area of policy concern. R&D expenditures are deductible in the same way as any other form of business expenditure. Measures to stimulate the venture capital market are also lacking. On the other hand some measures are in place in terms of stimulating the financing of innovation (SE 02, SE 08, SE 13), although these are quite old. In a similar manner, tax incentives are not a typical measure used in innovation policy in Finland. The benefits of tax incentives/tax concessions are not seen as efficient way to encourage innovation in this country where R&D volume is already high. Instead the support of leading edge R&D and innovation activities is viewed as more beneficial. Lastly, in Denmark fiscal instruments, including tax credits, as an inducement to innovation, are not used – R&D expenses are deductible in the same manner as other business expenditures. However, the limited use of tax credits must be viewed in the context of the relatively high tax level on personal income found in Denmark, where there is a general political agreement that changes in the tax structure must, first and foremost, address the personal tax structure. Indeed, the present Government has introduced a tax stop. Nevertheless, as a temporary arrangement and on experimental basis, the present Government has announced that measures will be introduced to make it more attractive for companies to invest in R&D. The instrument is a 150% tax



rebate on expenses incurred in research projects co-financed with public research institutions. The use of financial instruments such as options and warrants as means of remuneration to staff members has also been suggested as a way to ease the 'liquidity' strains on new enterprises.

Although not currently a user of fiscal incentives, the Irish Office of Science and Technology at the Department of Enterprise, Trade and Employment has requested Forfás to carry out a study of tax credits as a means of encouraging companies to invest in R&D. In addition, the main employers' body, the Irish Business and Employers Confederation (IBEC), is carrying out research on the benefits of a tax credits approach as an incentive to investment in R&D by companies.

In the **Candidate Countries** the use of fiscal measures appears to be a relatively well-used instrument used by governments either to stimulate the economy in general or specifically to promote innovation by industry. A review of Table 2 reveals that five countries have recorded progress in this Action line (Bulgaria, Estonia, Hungary, Latvia and Lithuania). Of the remainder, four report a stable situation and two (Cyprus and Poland) note a decline in activity. Details are provided below.

Increasing activity

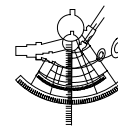
In Bulgaria, substantial amendments to the taxation legislation have been made in order to reduce taxes for companies and individuals, with the aim of creating a more favourable business environment and encouraging investment. The average taxation rate on total income was lowered from 19% in 2000 to 13% in 2001. In order to support the efforts of small businesses, the patent tax has been modified through the abolition of supplementary tax for each person employed in a company performing patent tax activity.

In Estonia, the only fiscal measure extended to companies that favours innovation is the Corporate Income Tax Act. Under this measure, tax should be paid on distributed profits, which implies that the part of the undertaking's profit which is not withdrawn from the company remains tax-free. Overall the act has been found to be very effective in favouring the development of enterprises.

In 2000, the Hungarian Government changed the taxation system so as to increase the private sector share of R&D financing. As of 1 January 2001, a new tax incentive was introduced. The new tax allowance applies not only to the developments of individual enterprises but also to inventions ordered by enterprises. Guidelines outlined in the action plan 'Scientific and Technology Policy 2000' came into effect in 2001, calling for an increasing degree of non-Governmental capital investment into R&D-related development.

The Latvian National Innovation Concept (2001) provides a strategy to create the necessary environment for productive innovative activity and to encourage innovative development of the Latvian economy. Among other points, the programme is expected to provide proposals on the amendments, new legal documents and the infrastructure necessary for innovative activity and the promotion of innovative enterprises.

The most important recent document in this area in Lithuania is the Minister of Economy's order, (13 December 2001) on industry, export and business development. This approved various forms of support to business, and covered compensation for Lithuanian enterprises participating in international and national exhibitions. Finally, at a general level, the rate of profit tax was reduced from 29% to 15%, starting on 1 January 2002.



Stable situation

Romania has several fiscal measures that stimulate innovation. These include exemptions from VAT (value-added tax), reduced taxes on salaries for employees involved in RDI activities, and import duty facilities for technology and software. According to law 547/2001 regarding VAT, units with research, development and innovation activities that execute programmes of the National Plan for Research Development and Innovation are VAT-exempt. The Romanian Fund of Credit Guarantees for the Private Entrepreneurs, and the Fund for Guaranteeing Rural Credits are also VAT-exempt. Governmental Emergency Ordinance 24/2001 changed the taxation procedures for micro-enterprises – a quarterly tax of 1.5% on turnover is paid by this category of SME, compared with the 25% tax on profits applied to other companies. Governmental Decision 65 (September 2001) provides tax incentives to investors in industrial manufacturing and related businesses, most significantly in the burgeoning Romanian information technology industry. Another measure to stimulate innovation was the elimination of taxes on salaries for IT specialists in software companies, since the Romanian Government has declared the Information Technology sector of strategic importance for the long-term development of the economy.

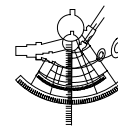
Although no fiscal framework aimed at the stimulation of innovation yet exists in the Czech Republic, the Government views this area as an important focus for policy. Similarly, in Slovenia fiscal measures are also considered very weak and debate on the precise fiscal measures to be used has only recently started. Those general tax incentives currently available to individuals and companies are few and not particularly effective in this context.

Declining activity

Fiscal policy in Cyprus has always been an integral part of economic policies aiming at the promotion of sustainable economic growth and meeting socio/economic objectives, while at the same time contributing to the achievement of macroeconomic stability. The role and importance of fiscal policy in promoting the real and nominal convergence of the Cyprus economy with the EU was strengthened with the Fiscal Consolidation Programme for the period 1999-2002. At the beginning of 2001, this Programme was revised, updated and extended through to 2004 with the adoption of more ambitious targets in order to sustain progress and ensure the compatibility of fiscal policies with the structural changes adopted for harmonisation purposes. As part of the programme, the income tax system will be reformed and modernised, to reduce and improve further the distribution of the tax burden, while enhancing the efficiency of the system. However, there are no fiscal measures to encourage innovation. While tax incentives for manufacturing industries were examined within the context of the new Tax Reform, they were eventually rejected.

Cyprus has also been an important offshore centre for a wide range of activities, and has developed into a strong Regional Business Centre during the last decade. A special favourable taxation regime currently applies to offshore companies but the Ministry has announced its intention to eliminate any preferential treatment by 2005, within the framework of the Tax Reform, so as to fully comply with the *Code of Conduct for Business Taxation* to the same extent as current Member States.

In Poland, prior to 1999 a tax measure existed which provided incentives for investing into new technologies. The measure applied to companies incurring investment expenditure on the purchase and installation of machines, licensing costs, patents. These could be deducted as investment costs from taxable revenue of up to 30%. As of 1999, this tax relief was abolished in view of the current taxation policy, which aims to reduce the corporate tax rate levels gradually from 40% in 1998 to 22% in 2004. The liquidation of this measure has been negatively assessed by Polish business circles.



Objective 3: Encourage the creation and growth of innovative enterprises

Action 3.1: Favouring the creation and development of start-ups

This action represents an area of policy priority for many countries. Table 1 indicates that eleven Member States (Austria, Belgium (Brussels-Region), Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal and Spain) report an increase in related activities. With the exception of Sweden, which reports a decline in activity, the activities of the other countries have remained stable. From Table 2, it can be seen that nine of the Candidate Countries (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Slovenia, Slovakia, Poland and Romania) report an increase in activities and only Bulgaria and Lithuania report a stable situation.

The type of measure adopted to achieve this goal vary considerably by mode of action and include:

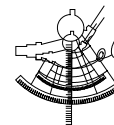
- venture capital provision;
- promotion of university spin-offs;
- support for young entrepreneurs; and
- other schemes.

Typical venture capital funding mechanisms

A number of countries already implement a range of equity finance support schemes. In Germany a new scheme that provides pre-seed venture capital for technology-based start-ups has been introduced in 2001 (BTU-Early Stage, DE 66). Other well-established venture capital programmes include the BTU-programme (DE 12), the tbG-Programme (DE_11), the KfW VC programme (DE 13) and the Futour 2000 programme (DE 20). Similarly, the framework for investment and risk capital financing in the Flanders region of Belgium has been in place for the last decade. The main mechanism is the regional investment company 'Guarantees on risk capital' (GIMV, BE 21) which provides incentives for venture capital firms to put more risk capital in investment in SMEs as well as some support for private initiatives such as Business Angels Networks (BAN, BE 28). A number of schemes have been introduced to improve small innovative companies' access to seed and development capital. Denmark also has a relatively long history in the provision of seed and development capital support. For example, since its foundation in 1992 the Danish Growth Fund (*Vækstfonden*, DK 1) has allocated a total of DKK 2 billion (€268 million) to around 800 Danish companies, and its legislative framework has been adapted several times to improve its efficiency in this segment of the capital market. The latest adaptation, in 2001, enables the Fund to invest directly in single companies and to co-finance development companies. Moreover, the revision paves the way for the Fund to follow a more market-oriented strategy, which should improve the social rate of return on its means. In the future the Fund will broaden its financial instruments to include equity placements and loans with interest rates conditioned on turnover. The Danish Government has also approved a number of private development companies to receive state risk sharing for losses arising from their investments in SMEs. The development companies often have a regional focus, and some of them are further specialised within certain fields. However, despite the implementation of measures to address the problem of seed and development capital for new and innovative companies, a recent report from the Growth Fund concludes that seed capital remains difficult to obtain.

The provision of a legal, fiscal and financial environment favourable to the creation and development of start-ups has for some time been a key UK Government priority for innovation policy. Support is provided in two main areas: fostering of a culture of entrepreneurship, and creating an environment in which new companies may flourish. For example, the Regional Venture Capital Funds – RCVF (UK 53) provide risk capital to growing SMEs and the UK High Technology Fund (UK 54) makes funding available to those venture capital funds specialist in investing in early stage technology proposals

Much more effort is needed to promote entrepreneurial spirit in Portugal, although one financial innovation measure has been recently introduced in order to address this situation. This aims at the creation of instruments for the capitalisation of SMEs (PT 24). Its goals include *inter alia* the



strengthening of financial instruments to promote the creation of new, innovative firms. Support will be provided for the creation or development of investment mechanisms to strengthen SMEs' own capital, as well as the creation of a Fund for Syndication and Discount of Equity Holdings to undertake activities in the area of venture capital. The creation of start-ups has also become a priority for Greek development policy in the last two years. A major emphasis is given to grants (PRAXE (GR 39) and TANEQ (GR 36), and the creation of interactions such as the Venture Capital Forum for the New Economy (GR 37).

University spin-off enterprises

Another important area of policy action in the field of spin-offs is the promotion of university spin-off enterprises. Typical examples include FIRST-Spin-off (BE 37), launched in 1999, which aims to help university researchers create spin-off enterprises. The Walloon Region in Belgium funds the salary costs of the researcher, and provides a subsidy to cover the overhead costs of the research laboratory and funding the training costs for the researcher. The measure is part of one of the main axes (FIRST programme) of the research and technology policy of the Walloon Government and translates the political will to promote research commercialisation, notably through spin-off companies.

In France support for the creation of seed capital funds (FR 13) is provided via funds and support co-operation to favour the creation of technology-based firms by universities or public research bodies.

Support for young entrepreneurs

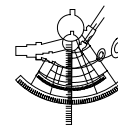
In Greece special support has been given to female entrepreneurship (GR 48) and youth entrepreneurship (GR 46) initiatives. Also in Italy, incentives have been introduced to create start-ups that encourage women to become entrepreneurs (Presidential Decree No 314/2000). Here, the 'guided planning initiative offered by Sviluppo Italia (IT 23) aims to assist young aspiring entrepreneurs, including those with no business background whatsoever, in fleshing out their ideas for a business.

In the UK, measures aimed at promoting a culture of entrepreneurship include initiatives such as the Science Enterprise Centres (UK 21) in which business and entrepreneurial skills are taught to science, engineering and technology graduates and the Enterprise Insight Campaign (UK 50) – which targets young potential entrepreneurs aged from 5 to 30.

Luxembourg's Société Nationale de Crédit et d'Investissement (SNCI) has introduced a 'starting loan' to encourage new entrepreneurs (firm creation and firm recovery) by the financing of stockholder equity. It represents an alternative for the entrepreneurs who are unable to benefit from venture capital.

The Ministry of Commerce, Industry and Tourism in Cyprus has launched a new measure in April 2002 to support women in entrepreneurship. This aims to develop, support and promote entrepreneurship for women aged 18-55 who wish to establish a business in manufacturing, trade, services or tourism.

As part of business support policy in the city of Tallinn in Estonia, a start-up enterprise measure was launched primarily for entrepreneurs who are "just starting out".



Other schemes

Italy has introduced a system of reduced taxation for new enterprises set up by entrepreneurs and for individuals setting up as self-employed. The goal is to provide incentives for persons to set up new enterprises or to become **self-employed**, and provide assistance during the early years of activity, where high start-up costs and a modest amount of business are typical.

To increase access and transparency of the venture capital market in Sweden, NUTEK has launched an Internet-based service (SE 13). The Venture Capital Database is a database from which start-ups and SMEs can access information on the most suitable risk capital companies to contact. Another example of administrative simplification was the launch in January 2000 of a free Internet service in the form of an interactive website (*Företagarportalen*) in the wake of proposals made by the Small Business Council (SE 12). The aim is to improve the dialogue of different administrative public bodies with present and future entrepreneurs.

At the broader policy level, the Norwegian Ministry of Industry and Trade has produced an internal document on the need for a new entrepreneurship policy.⁵ This work will probably be integrated in the current process for the development of a new innovation policy and should address this action line of favouring the creation and development of start-ups.

Several types of initiative are also observable in the **Candidate Countries**.

Since 1998 a micro-financing programme run by CRS/USAID has been offered in Bulgaria. The programme offers credits to small and family-run companies located in the regions of Pleven, Stara Zagora and Nova Zagora. The companies should conduct business in the fields of commerce, services and production.

In Romania the start-up of technology-based companies is being stimulated by the GD 65 (September 2001), which outlines the framework for Industrial Parks. This Law is the third element of a legislative scheme that also includes the Law on Disadvantaged Zones (Law No. 20/1999), and the Law No. 84/1992 regarding Tax-Free Zones. The new Law provides tax incentives to investors in industrial manufacturing and related businesses. Most of all, the burgeoning Romanian information technology industry will benefit from the new law.

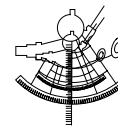
In Slovenia a 'voucher system' is being introduced to assist the setting up and development of start-ups. Subsidies via vouchers can be used to pay for a wide variety of counselling and professional services in areas that will assist them in starting businesses.

Action 3.2: Innovation support structures and services

From Table 1, it can be seen that five Member States countries (Finland, Greece, Ireland, Luxembourg, and Spain) report an increase in activities of this particular Action. With the exception of Norway, which reports a decline in activity, the activities of the remaining countries have been stable. From the perspective of the Candidate Countries, (Table 2), it can be seen that five (Cyprus, Bulgaria, Estonia, Latvia, and Romania) have reported an increase in activities, whilst those in the remaining Candidate Countries activities have been stable, with the exception of Poland, which reports a decline in activity.

Action 3.2 is concerned with fostering regional level creation or reinforcement of adequate support services and structures such as incubators. The experience so far is mixed with respect to this action

⁵ *ENTREPRENØRSKAPSPOLITIKK – en næringspolitikk for fremtiden?* (Entrepreneurship policy – an industrial policy for the future). Unpublished internal document, The Ministry of Trade and Industry, January 2002.



line. Therefore the following selection of measures illustrates the variety of support services and structures recently introduced across Europe.

Examples from Member States and Associated States

Germany has a long tradition of establishing infrastructure-based support services to innovative firms. The services operate on a regional level and cover mechanisms such as incubators, technology centres and consulting networks. Some focus more on the science side, while the majority provide services for SMEs. Given this extensive supply, there is little need to add further supportive infrastructure. The public discussion focuses rather on how to raise their efficiency. In addition, the programme 'Regional Innovative Growth Poles' (DE 57) promotes thematically focused networks in eastern Germany. Likewise, the Belgian regions' policy orientation predates the September 2000 Communication with the regions continuing to finance 'Business Innovation Centres' (e.g. in Wallonia BE 51); and 'Incubators and Innovation centres' located in research and scientific parks or on university campuses (e.g. in Flanders, BE 27).

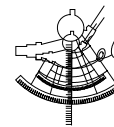
Denmark has several measures that address this action. It has established eight Technology Incubators (DK 4) to promote co-operation between the public knowledge system, new innovative companies and capital sources. These are organised as centres and are regionally distributed and work in close co-operation with universities or science/research parks. The centres are directed towards innovative entrepreneurs, researchers and students and have at their disposal state-financed seed-capital to offer to entrepreneurs, combined with consulting services and training, premises and administrative services. Also a number of Approved Technology Service institutes – GTS (DK 8) – have been established. These are private independent companies offering consulting services and application-oriented knowledge to companies and public institutions on an individual basis. At present there are 11 such institutes, the purpose of which is to enhance the development and application of knowledge related to technological, managerial and market issues. Furthermore they are meant to induce innovative action by firms. The GTS-institutes cover a wide range of scientific areas and technological fields and operate on near market terms, as the main part of their revenue comes from advisory services paid for by companies. Lastly, the regionally-organised TIC-net, a network of nationwide information and consulting centres, provides advice and information to local SMEs.

Ireland has introduced a 'Third Level Incubation Centres' initiative, which provides funding to assist third-level colleges to develop and expand incubation their space facilities. The initiative is open to universities and Institutes of Technology that wish to facilitate economic activity resulting from campus innovation. A similar initiative is the Regional Business Incubation Space, which seeks to strengthen the regional innovation infrastructure by facilitating the provision of incubation and commercial R&D space for the development and establishment of high potential businesses, with particular emphasis on the role of the Institutes of Technology.

For Portugal the PME Digital (PT 27) programme envisages the creation of Information and Technical Assistance networks (RIAT) to provide information, technical assistance and training services for SMEs. At the regional level, LISACTION (PT 28) includes an axis on the development of technology and information support systems for SMEs in the Lisbon and Tagus Valley region.

In Greece, innovation support is given both by the GSRT and the General Secretariat of Industry. The GSRT funds Incubators and Science and Technology Parks (ELEFTHO (GR 45)) and the promotion of excellence in Research Centres and Institutes is able to offer services to the productive sector (GR 50).

The Italian 2000-2006 Country Operational Programme (Development of Local Entrepreneurship), includes several measures providing assistance to enterprises. This intervention is intended to promote and support projects that increase innovation and the firm's strategy by providing specialised advice.



In France, the introduction of the regional incubators structures (FR 12) measure aims to move towards a more interactive model based on consortia structures, where universities and public bodies (research structures) can make a better contribution to the creation of innovative firms.

In Spain, most support structures for NTBFs are provided on the basis of regional economic policy. Also incubators, including virtual ones, involve a diverse set of sponsors and stakeholders, including local development agencies, universities, science-parks and non-profit actors.

In 2001 there were 30 Science Parks in Sweden with around 1700 enterprises with 50 000 employees. The existing incubators focus their service activities on spin-offs from Universities and Large Enterprises. Currently, a proposal to Government is being prepared by VINNOVA in order to increase the number of incubators and the amount of public seed funding in Sweden.

The UK regional innovation fund (RIF –UK 44), is an example of a measure designed to foster the creation of support services and structures such as incubators. Funding will be allocated to England's nine RDAs with the aim of promoting innovation and enterprise in the regions, partly by providing support to clusters and networks of businesses. Also the Small Business Service (SBS) of DTI is currently launching a 'Business Incubation Fund' to "encourage business start-ups and growth in managed workspace with flexible leases, good communications and business advice and support".

In Finland the *Yrityssuomi.fi* (Business Finland) network service has been launched in February 2002. The new service is a significant and concrete step in the collaboration between the public corporate financiers and service organisations, i.e. Finnvera plc, Finpro, the Finnish National Fund for Research and Development (Sitra), Finnish Industry Investment Ltd, the National Technology Agency (Tekes) and the Employment and Economic Development Centres (T&E Centres). This network is aimed at assisting small and medium-sized enterprises, entrepreneurs and would-be entrepreneurs to find the public services for starting up an enterprise and those related to its growth, development and internationalisation.

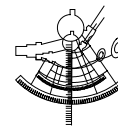
Some Candidate Country experiences

In Bulgaria, the major organisations active in delivering innovation support to businesses are usually HEIs and science/technology parks or centres. Their role is mainly concerned with developing or implementing innovation policy through partnerships or network initiatives with employers federations, networks of innovation interested organisations and chambers of commerce, etc.

Slovenia currently has three technology parks, which offer premises, equipment and consulting to SMEs. Technology parks are not-for-profit legal entities and are targeted by dynamic new companies looking for new technologies, products and services and are just beginning to use the results of their research.

Romania has seen the creation of more than 50 'Business Incubator Centres' mainly through private funding and support. In addition an 'Innovation Relay Centres Network' has also been introduced. This network aims at promoting innovation, encouraging exchange of research results between organisations and providing advice, consulting and training support. There are 6 regional partners based in universities, which provide information to SMEs, universities and research organisations.

In Cyprus, the Ministry of Commerce, Industry and Tourism is establishing at least four other business incubators (CY 5). In the autumn of 2002 a new Estonian incubator will be completed with support from the State and Tallinn City. It will be located near the Tallinn Technical University and will form a component of the envisaged Tallinn Technology Park. The centre is planned to contain 15-20 technology-oriented enterprises.



In Poland, local Governments have established a number of agencies for regional development, which in turn have set up incubators. The scope of support in such incubators is usually limited to renting out office and production space at preferential rates.

While there are no examples in Latvia of any measures designed directly to foster the creation or reinforcement of adequate support services and structures such as incubators, etc., there are some activities which do indirectly affect innovation support structures and services. For example, the project 'Support to Industrial Cluster Restructuring' funded by the PHARE programme was completed in Latvia last year and formed the first cluster support measure in Latvia. Also the development of the state support mechanism in the area of information, consultation and training (following the example of Sweden) will allow the setting up of a one-stop agency with the so-called Starting line (telephone and Internet service providing free access to information) and proposals on how to start a business in Latvia.

Action 3.3: Training in entrepreneurship and innovation management

Seven of the Member States and Associate States (Finland, Germany, Ireland, Luxembourg, Netherlands, Portugal and Spain) report an increase in activities against this particular Action line (Table 1). The activities of remaining countries have been stable. From Table 2, it can be seen that five Candidate Countries (Czech Republic, Estonia, Latvia, Romania and Slovenia) report an increase in activities while the remaining Candidate Countries have been stable.

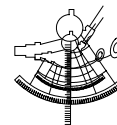
Action 3.3 is primarily concerned with the setting up of education and training schemes in entrepreneurship and innovation management where none exist in higher education establishments and business schools, and with the dissemination of good practice in this area. The following examples of this type of scheme show that they have been introduced in a variety of different formats to suit different national circumstances, demands and contexts.

Member States and Associate State countries

An interesting initiative in the area of innovation management training was launched by PROINOV in Portugal, through the 'Advanced Training Course on Innovation Policies and Management'. The objective is to train 'agents of innovation' who may act as promoters and catalysts of innovation processes in their organisations, regions and/or industries. With regard to entrepreneurship, a relevant initiative was taken by the Institute for Advanced Entrepreneurial Training (IFEA) of the Instituto Superior de Economia e Gestão (ISEG), of the Technical University of Lisboa, where the training programme for entrepreneurs involves presentation training and distance training, in a post-work regime, through the use of multimedia system.

Among the many initiatives to reform and modernise Germany's universities, some explicitly focus on courses to enlarge the supply of training on entrepreneurship and innovation-related topics. For instance, the BMWi actively supports the establishment of chairs of entrepreneurship at HEIs (DE 60). There are further actions in the field of promoting vocational and further training provided by the BMBF, such as the promotion of vocational training infrastructure.

An important element of the Government's strategy for upgrading Ireland's skills in innovation management are the courses provided by the National Institute of Technology Management (NITM) located at University College Dublin (UCD). The NITM was established to raise the profile and capability of technology management in Irish-based enterprises through teaching, research and policy input. The NITM runs a Masters degree programme in Technology Management and has recently broadened its offerings with the introduction of its Higher Diploma in Technology Management. Enterprise Ireland also funds the Graduate Enterprise Programme (IE 23) which provides training in enterprise development and financial support to graduates who have been employed in industry and who are prepared to start their own business.



On the basis of the results of its national legislation on start-ups by young people, Italy is developing an annual programme to disseminate entrepreneurial culture in schools and universities. For its training programmes, IG Students call on expert trainers and tutors using a centralised assistance system. The role of these trainers is to provide students with advice and guidance on how to run a business “in the lab”.

In Belgium, the promotion of entrepreneurship continues in most national university and third-level training establishments which develop business start-up training modules directed at students. Universities and higher educational establishments also provide the founders and managers of SMEs with one-off programme facilities and efficient management tools. In the area of training, the Regions fund specific measures coordinated by training bodies which, in addition to advisory and reception services, provide *à la carte* programmes for people wishing to start up their own businesses.

In Sweden, entrepreneurship and innovation management courses have been introduced on a broad scale at different levels in the education system. Examples of the increased focus on entrepreneurship are the Centres of Entrepreneurship in Linköping and Uppsala as well as the International Business School in Jönköping, focused on entrepreneurship and small business management. Similarly, in 1995 the Danish Minister for Education set up a Committee on Entrepreneurs and Education. Based on the recommendations from the Committee’s report, the Minister launched an action programme aimed at introducing the subjects of entrepreneurship and innovation in the education system on a broad front. In addition, courses have been introduced on a broad scale in various parts of the Danish education system, and education programmes on entrepreneurship and innovation have been established at various educational institutions (“vocational education for the young”). The present Government has recently launched an action programme ‘Better Education’ in which it highlights the need to incorporate the subjects of entrepreneurship and innovation in education.

In the UK measures aimed at promoting a culture of entrepreneurship include initiatives such as the Science Enterprise Challenge – SEC (UK 21) in which business and entrepreneurial skills are taught to science, engineering and technology graduates. At the regional level, in Wales senior staff are being appointed as ‘entrepreneurship champions’ at all colleges and universities. Each institution receives funding from the Welsh Knowledge Exploitation Fund (KEF). All of the champions are now in post and all have industrial experience. The KEF is intended to encourage enterprise in the Further and Higher Education sectors in Wales and to help institutions exploit their knowledge base.

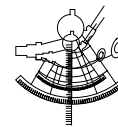
For Luxembourg one of the most important projects led by the Government (more particularly by the Ministry of Higher Education and Research) is the creation of a ‘University of Luxembourg’. This project aims to respond to the need to have a competitive education system at the European level, co-operating with other universities, and offering the students mobility and a large range of education.

Some Candidate Country examples

In Bulgaria, State bodies, central institutions, local and regional institutions, NGOs and international organisations, sponsor special seminars on entrepreneurship. The Bulgarian Chamber of Commerce and Industry organises courses on quality management (ISO 9000), taxation issues and structural funds on a regular basis.

In recent years the Cypriot department of the Register of Companies and Official Receiver has been organising seminars and lectures on management skills and legal knowledge for entrepreneurs. The University of Cyprus is also in the process of adding a new course on ‘Entrepreneurship Management’.

Hungarian universities of economic and technical sciences and business colleges run courses in innovation management, but these are only indirectly financed by the Government since every university and college is supported by government funds.



In Latvia, the Riga International College of Economics and Business Administration (RICEBA) runs a management programme for SMEs. The main thrust of this programme, which started in 1998, is to encourage small business owners to think strategically and move away from a product-oriented towards a market-oriented approach. Also the American Chamber of Commerce in Latvia organises a Student Business Plan Competition, the purpose of which is to encourage the development of business skills among future entrepreneurs and employees. It is open to students enrolled in all post-secondary institutions in Latvia.

In Romania, a number of links exist between universities and enterprises, working for the benefit of both. Students are given the possibility of practical experience and also have the opportunity to work alongside professors to solve specific industrial problems in an enterprise. There are continuing educational courses for specialists from industry.

In Slovenia, universities have been requested to cover entrepreneurial seminars such as business planning, intellectual rights protection in their postgraduate curriculum. However, this is only a request made to the Universities, and encouragement such as funding is not currently provided. University programmes are already providing this type of coursework to students.

Objective 4: Improving key interfaces

Action 4.1: Innovation at the regional level

From Table 1, it can be seen that eleven of the Member States and Associate State countries (Austria, Belgium (all regions), Denmark, Finland, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain) report an increase in activities of this particular Action. The remaining countries' activities have been stable. Table 2 indicates that six Candidate Countries (Bulgaria, Estonia, Hungary, Latvia, Poland and Romania) report an increase in activities and the activities of the remaining Candidate Countries have been stable.

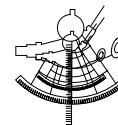
Action line 4.1 concerns the stimulation and coordination of regional initiatives and regional actors to devise and implement integrated research and innovation programmes at the regional level. Here are selections of typical initiatives that have been reported as being undertaken recently.

Member States and Associate State countries

Due to the federal character of the German state, the *Länder* perform most significant innovation support activities on a regional level. Each of the 16 *Länder* run their own innovation programmes, and many of these programmes have an explicit regional dimension, e.g. they focus on those technologies or industries which are either highly significant, face certain problems or are promising targets for future growth.

In Portugal, one activity concerns 'LISACTION', the Lisboa and Tagus Valley Programme on Innovation-oriented Actions (PT 28). This Programme builds on the experience of RITTS and is structured around two main themes: the regional economy based on knowledge and technological innovation; and the information society at the service of regional development. LISACTION has four strategic axes:

1. improving the interaction between R&D and innovation, with actions concerning the organisation of Workshops and Open Days, and the creation of R&D and centres for technology transfer through partnerships between S&T institutions and companies;
2. increasing information and technology support services at the regional level;
3. promoting technology transfer, namely through the support provided to technology-based entrepreneurship as well as to technology poles at the regional level; and
4. awareness raising for technology and the information society.



The Greek Government has, for the first time, instigated the adoption of both regional innovation policies and regional information society policies. The key idea of the articulation between the national and regional level is that larger areas of intervention will be handled at the national level (Operational Programmes for Competitiveness and the Information Society respectively) but the regions should foresee their specific needs at the local level and use regional funding to match national funds (IS) or complement national activities (innovation).

In Ireland, the BMW (Border, Midland and Western) and S&E (Southern and Eastern) Regional Assemblies, are the lead agency for their respective Regional Operational Programme. These new regional structures in theory give the regions greater input into the development and implementation of research and innovation programmes. However, both Regional Assemblies are of very recent origin and it may take time before their impact as a coordination mechanism, particularly in terms of innovation policies, is known.

The French Government is also active in the stimulation and coordination of regional initiatives and actors. The national government makes decisions and coordinates regional actions at the national level, while the national delegations in the regions (DRRT, DRIRE and the ANVAR) are in charge of implementing those decisions. In this context, and as well as the actions taken in measures such as the incubators, technological platforms and the national research network, ANVAR and DRIREs act as pillars of innovation national policy at the regional level. Again, it should be noted that ANVAR is one of the most important actors in the region, and that the regional councils always act together with the agency.

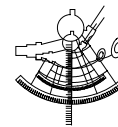
In Spain, the Central Government has also launched specific innovation support instruments with a high impact on regional development. These are programmes devoted to increase and reinforce innovation infrastructure, for example, a programme to develop science parks, and a programme to encourage reindustrialisation. It should be understood that central policy support also pushes and mobilises associated efforts at the regional level.

In Sweden, to capitalise on the recognition of the potential of geographic proximity to create competitive advantage in terms of interaction, learning, access to skills and co-operation in development and business, VINNOVA is launching a new programme in 2002 called 'Regional growth through dynamic innovation system' (SE 19). The objective of this programme is to stimulate innovation and growth in the Swedish regions.

The Danish Regional Growth Centres (DK 13) are intended to promote co-operation between companies and technological knowledge institutions and market development, based on existing regional strengths. The idea is to develop centres based on regionally-based technologies or competencies having commercial potential, where companies, vocational educational institutions and technological service institutions may collaborate in development projects. The centres make available facilities and manpower to local trades and industries and also serve as a framework for developing educational competencies. For their first three years of operation the centres are co-financed by the state, regional authorities/institutions and local business. Regional growth centres are established as consortia, comprising at least one educational institution and one technological service institution (usually one of the relevant GTS institutes). Other members may be local authorities, companies, and private consultants.

In the UK's English regions, strategic frameworks for innovation are provided by Regional Innovation Strategies (RIS) developed by the Regional Development Agencies in consultation with a broad range of regional and local actors. An RIS may typically address issues such as the identification and stimulation of:

- industrial sectors of particular regional significance;
- regional networks that foster collaboration, the exchange of good practice, etc.;



- the level of interaction of universities and research institutions with local/regional businesses, particularly SMEs.

The main tool available to RDAs to assist in realising their RIS is the Regional Innovation Fund (UK 44).

The Austrian 'Reg-Plus-programme' of TIG (AT 48) will further promote innovative project in technology parks. Around fifty technology and founders' parks have been opened in Austrian regions in the last decade. In view of the increased competition among European locations, the Federal Ministry of Transport, Innovation and Technology's new Regional Impulse Scheme 'RIF 2000' supports innovative projects launched by regional Impulse Centres. The REG-plus module (AT 48), which forms the core of RIF 2000, represents a clear shift of focus from subsidising the material infrastructure of regional Impulse Centres to promoting their innovative 'content'. REG-plus is to enhance the capacity of existing centres, as well as these centres' activities for the enterprises of the respective region. REG-plus can support Impulse Centres throughout Austria, independent of their designation under the EU's Structural Funds. A new element is the competitive principle, which is to ensure the high quality of proposed projects.

A Finnish Ministry of Education working group has evaluated regional coverage and the requirements for the development of teaching in higher education, as well as research and development activities. An action plan by the working group recommends connecting development to the economic and industrial structure and its place in the region. It has classified the provinces into three groups on the basis of skills, innovation, and population variables – innovative growth regions, neutral regions, and less developed regions – and has suggested development activities for each. The working group separately examined the development of higher education institutions in the Helsinki metropolitan area.

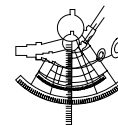
Some Candidate Country examples

In Poland the 'Centres of Excellence' play a very positive role at the regional level. Within the initiative, five pilot Centres of Excellence have been established. Their fields of scientific research range from chemistry and neurology to information technology and production engineering. Geographically, Centres of Excellence are located in four *voivodships* (provinces) and their partners (35 all together) are based in nine locations. The model and structure of the Centres of Excellence was based on the idea of networking research centres, which are coordinated by a top-level institute consisting of at least two research units and one or more industrial companies. The formal basis for operation is a consortium agreement concluded between the partners.

In Bulgaria, three new regional plans for industrial development have been furnished for the municipalities of Smolyan, Madan and Nedelino in the Rodope region. These plans include 60 projects with a total value of approximately €30 million and will initially help to open 1700 new workplaces. The total number of the municipalities with regional industrial plans has increased to eight.

The Estonian 'Tartu Regional Innovation Strategy' (TRIS) project was formally launched on 1 January 2002. The first TRIS steering committee session took place on 1 February 2002. The project coordinator is the Tartu city Government and the daily running of the project is the responsibility of the Tartu Science Park. A detailed plan of TRIS activities is to be approved by autumn 2002.

The Hungarian Széchenyi Plan (HU 24, Science and Technology policy) has set as its aim the invigoration of regional innovation. According to the policy, the economic development programme contains – as one element – a regional innovation strategy, which requires target-oriented co-operation between the Government and business sector.



Action 4.2: Lifelong learning

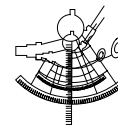
In the knowledge-driven economy, 'lifelong learning' is critical to innovation. Lifelong learning is a typical multi-stakeholder issue influenced by a large number of different but inter-linked policies. Paradoxically, the demand for lifelong policies has been largely driven by the need to keep pace with the increasing pace of technological advances and their influence on both the work and social environments, whilst the application of these technical advances, particularly in the field of ICT, has provided policy makers with a highly useful tool for the delivery of such policies.

In order to deal with an issue as broad and pervasive as lifelong learning, it has been necessary to narrow the focus of this analysis and to concentrate on government measures or policies aimed at facilitating the implementation of lifelong learning programmes which improve the general assimilation of new technologies and remedy shortages of skills. These include 'Information Society' initiatives, for example, together with more focused initiatives aimed at training/recruiting IT workers, or workers in other areas where there are perceived shortages of skills. A fuller analysis of these policies across the Member and Associate States and in the Candidate Countries has been provided in a parallel report⁶. The following section provides a synopsis of the findings of this analysis and enquirers seeking a more comprehensive picture of lifelong policies are referred to the separate report.

The overall description of the initiatives adopted by countries demonstrates the pervasive character of support for lifelong learning generally, and much diversity in the type of support provided. There is much evidence to suggest that lifelong learning is an important policy objective, underpinned by the launch of specific strategies or action plans in many countries. Generally, support for lifelong learning encompasses a wide range of measures. The examples of approaches to lifelong learning adopted across European countries tend to follow the broad categorisation set out below:

- Government strategies and plans:
 - Guidelines on lifelong learning within national strategies
 - Specific Action Plans on lifelong learning
- Investigations into lifelong learning
 - Studies/reports/research programmes
 - Seminars, debates and consultation forums
- Lifelong learning support
 - Institutional measures
 - Institutional initiatives/agreements
 - Participation in Community initiatives
- Awareness raising
 - Web-based initiatives
 - Other awareness raising
- Training initiatives
 - Education-based initiatives
 - Training in ICT
 - Vocational training
 - Technical training to executives and engineers
 - Civil Servants training
 - General Training
 - Adult Training
- Incentive schemes
 - Self-employment schemes
 - Tax facilities.

⁶ Cunningham, P.N. and Uyarra, E. *European TREND CHART on Innovation: Thematic Report: Lifelong Learning – an overview of national measures in the EU Member States and Candidate Countries*. May 2002.



Before examining the various approaches adopted towards lifelong learning by countries, the overall situation, as shown by Table 1, is that eleven Member and Associate States report progress in this area (Austria, Belgium (Flanders), Denmark, France, Germany, Greece, Luxembourg, the Netherlands, Spain, Sweden and the UK), and the remainder, with the exception of Ireland which reports a decline, show a stable situation. Eight of the Candidate Countries (Cyprus, Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland and Slovakia) report progress on lifelong learning, the remainder reporting no activity.

Government strategies and plans

These plans include high-level (Government/Ministerial) strategic pronouncements and policies which deal with the issue of lifelong learning. These may be national economic development or innovation plans explicitly mentioning the issue of lifelong learning, or more specific action plans dedicated partially or completely to this issue.

Guidelines on lifelong learning within national strategies

A number of strategic policy documents which outline objectives for lifelong learning within the broader national economic or innovation context can be found in many countries. For example, the UK's White Paper on Enterprise, Skills and Innovation, *Opportunity for all in a world of change*, makes numerous explicit and implicit references to lifelong learning. Likewise, in Norway, the issue of lifelong learning forms an important part of the educational policies of the Government, according to the latest budget proposal, while in Portugal, the National Employment Plan defines the main objectives for the national lifelong learning strategy. In Finland the 'Development Plan for Education and University Research' for 1999-2004 identifies lifelong learning as one of the main principles underlying the development of education, while the new national strategy for education, training and research in the information society sets the goal that, by the year 2004, Finland will be one of the leading knowledge and interactive societies.

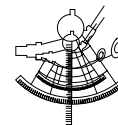
In the **Candidate Countries**, the 'National Innovation Programme' of Latvia is expected to define guidelines for the creation of innovation culture and a society open to innovation, and is assumed to cover aspects of lifelong learning as well. A major policy document from the Government of Lithuania, the *Measures for implementation of the Government's Programme for 2001-2004* (LT 14), foresees an important objective relating to the issue of lifelong learning, namely the preparation of a 'Strategy for ensuring lifelong learning and an action plan for its implementation', while the draft version of a national strategy concerning the development of an Information Society (*Lithuania – a Country of Global Possibilities*) contains as a priority objective, the goal of developing a 'competent society'. Within this context, the emphasis is put on the importance of lifelong learning. A further example is provided by the Hungarian 'National Information Society Strategy' which states that lifelong learning should be achieved through training adults to use info-communication equipment.

Specific Action Plans on life long learning

In addition to the priority granted to lifelong learning in government policy documents, support has also materialised in a number of countries in their action plans and strategies which were specifically targeted to lifelong learning.

One example is provided by Belgium, where the Flemish Government has approved an action plan on lifelong learning⁷. A further action plan was approved by the Flemish Government in February 2002. In Germany, the Federal Ministry of Education and Research (BMBF) has produced an Action Programme entitled *Lifelong Learning for All* which identifies fields of action for a learning society and lists several measures (for example, the programme 'Learning Regions' (DE 53), the pilot programme 'Lifelong Learning', and the programme 'New media in education' (DE 44)). In Luxembourg, the policy document *e-Luxembourg*, sets out a plan which aims to ensure that the country can benefit from the Information society. The plan focuses on the need for firms, citizens, and the administration to acquire

⁷ Actieplan *Een leven lang leren in goede banen*, July 2000.



and use efficiently the new electronic communication electronic tools that are available. The Spanish 'Info XXI Action Plan' focuses on learning in ICT and foresees actions aimed to increase lifelong learning on ICT as well as to encourage and promote the utilisation of new technologies in companies and updating public administration.

Denmark is in the process of introducing a major reform of its vocational education and continuing training system. In May 2000 the Parliament adopted a number of acts which came into force in January 2001. These combine programmes for continuing training and further education together into a single coherent and transparent adult education system. The main objectives of the vocational reform are to provide relevant adult education and continuing training supply to all adults at all levels, from the low-skilled to university graduates, and furthermore to improve opportunities for those holding the lowest levels of education. The acts introduce two new educational systems: Preparatory Adult Education (FVU) and the Adult Education System (VUS) which includes Basic Adult Education (GVU), and three advanced (higher) levels of further education (Further Adult Education (VVU), Diploma, and Masters degree.

In the **Candidate Countries**, in 2001 the Estonian education minister formed a working group of experts to develop an 'Estonian strategy for lifelong learning'. The Slovakian Government has published a document which defines the country's education systems' objectives for the next 15 years. *Millennium – National Programme for Education and Training* foresees a gradual increase of funding for education, and mentions the need to develop a strategy for lifelong learning.

Investigations into lifelong learning

Prior to, or in parallel with, government strategies, a series of initiatives has been commissioned to enhance the knowledge and the implications of lifelong learning. These have taken the form of studies, reports, and targeted seminars or consultation exercises, to enhance the understanding of the problem, and to provide the basis for developing specific strategies on lifelong learning.

Studies/reports/research programmes

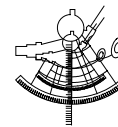
Examples under this category include a study commissioned by the UK Treasury into the provision of skilled researchers. This was prompted by an earlier Treasury study which identified the need to ensure that businesses are able to access suitable employees at all levels and thereby reduce one of the key potential barriers to R&D and innovation⁸. The working group reported in early April 2002. In Spain, a joint study (PAFET) on new skill requirements by ICT enterprises was undertaken in 2001 in order to check on-going academic profiles and industrial requirements. In Belgium, the Flemish Government commissioned a joint study on lifelong learning which resulted in the CONBEL-report⁹, which presented some key ideas and proposals on lifelong learning. Similarly, in Ireland, the Task Force for life-long learning was established by the Department of Enterprise, Trade and Employment in collaboration with the education sector to explore the wide range of issues concerning lifelong learning. Another example is provided by the Finnish research programme 'Life as Learning', which is scheduled to run during 2002-2006. In Greece, a number of studies to improve the quality and planning of lifelong learning programmes have been performed, both at the national and regional levels. Similarly, in Portugal, several studies by various Government agencies have been carried out to identify human resources requirements with a view to defining priority areas for lifelong education and training.

Within the **Candidate Countries**, a private Polish company (Demoskop) has been commissioned to conduct an analysis of the demand for learning and training, and of existing Government measures. The report, *Market for adult learning and training services* has now been produced.

Seminars, debates and consultation forums

⁸ HM Treasury/Inland Revenue *Increasing Innovation – A Consultation Paper*, Budget 2001.

⁹ BAERT, H., VAN DAMME, D., *Uitgangspunten en contouren voor een samenhangend beleid van levenslang leren in Vlaanderen*.



A number of examples are available under this category. France has held a debate on life-long learning, at the regional forum for science and technology, while Germany's "Forum Education" was designed as a special body within the *BLK* (Joint Conference on Education Planning and Research Promotion of the Federal Government and the *Länder*).

A number of seminars and debates are to be held throughout Estonia during 2002 on a strategy for lifelong study. These discussions will be organised by the Estonian Adult Educators Association (ANDRAS).

Lifelong learning support

Several initiatives have been taken to accommodate existing institutional conditions for prioritising lifelong learning, e.g. through increasing institutional coordination or institutional agreements among the relevant social partners or stakeholders. Participation in Community initiatives such as Socrates is also receiving a lot of attention.

Institutional measures

An example of this type of approach is found in Portugal, where inter-ministerial co-operation (between the Ministries for Education and for Labour) has led to the creation of the National Agency for Adult Education and Training (ANEFA) and the National Agency for the Coordination of Socrates and Leonardo da Vinci programmes.

Institutional initiatives/agreements

An agreement of the Social Concertation Council, on Employment, Labour Market, Education and Training in Portugal has some relevance to the issue of lifelong learning. The agreement, signed by the Government and all social partners (employers associations and trade unions), is aimed at reducing the weaknesses of the Portuguese labour market. In Spain, an agreement directly targeting ICTs was reached between the entrepreneurial associations (ICT sector) and the National Institute for Employment (INEM), with the general aim to develop training programmes (as FORINTEL) to update labour profiles to the demands of ICT enterprises.

Participation in Community initiatives

A number of countries have provided examples of their participation in European Community initiatives (such as Socrates and Leonardo) as approaches to the development of lifelong learning. In general terms, the new generation of EU Education and Training Programmes place greater emphasis on lifelong learning. Grundtvig, a new action within the Socrates programme, aims to enhance adult education provision through European co-operation. This programme will support:

- transnational co-operation projects;
- learning partnerships;
- mobility for training of educational staff and networks.

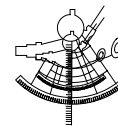
Most, if not all, EU Member States and Candidate Countries can be expected to have some level of involvement in Socrates and similar programmes.

Awareness raising

Web-based initiatives

The development of the Internet, and the huge uptake of the technologies required to support its use, have provided governments with an invaluable medium for the dissemination of information to stimulate lifelong learning, as well as providing a medium for delivery of a range of lifelong learning packages. Two examples are: the 'further education database' developed by the Austrian Public Employment Service, and the 'intellectual exchange' launched by the Bulgarian Ministry of Education. Many other examples are assumed to exist throughout the remaining countries covered by this study.

Other awareness-raising initiatives



An example is the Information Society Promotion Office is operated by the ARC Fund in Bulgaria. Its main objective is to support the development of an information society through raising awareness in the general public, industry, public administration, NGOs and academic institutions, as well as by fostering the uptake of e-business applications among SMEs.

Training initiatives

There are numerous examples of training initiatives. These tend to vary according to the agency through which they are delivered and in terms of their target audiences, ranging from the general public, to adult learning, executives, engineers or civil servants. Moreover, a large part of these initiatives specifically target ICTs.

Education-based initiatives

Examples here include the Netherlands' Axis Foundation (NL 25), the UK's Science Ambassadors Scheme (UK 41), and the Research Promotion Foundation in Cyprus. Planned initiatives include the draft paper of the "*National Concept for Development of Higher Education and Higher Education Institutions in the Republic of Latvia*", setting out the strategic position for the development of higher education system until 2010. The concept is expected to define the details of a system of qualifications (including credit points for part-time study and lifelong learning).

Training in ICT

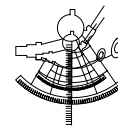
This type of approach was felt to be one of the most innovation-relevant applications of lifelong learning. It is not surprising therefore that a large number of illustrations was found for this section. These include the programme 'eFit Austria' and the LERNET scheme (DE 51), operated by the BMWi in Germany. Likewise the Dutch Government is investing in several projects that aim to resolve personnel shortages in ICT, and in Spain the INFO XXI Action Plan has developed several programmes (like the FORINTEL Programme) to provide special IT training. Meanwhile, the UK has introduced a range of measures which deal with training in ICT. The Government has targets to train up to 10 000 more people each year in advanced ICT learning through the New Technology Institutes and also to pilot New Deal programmes to move 5 000 people into ICT jobs. At the more general level of raising ICT skills and awareness, the Government is introducing 6 000 UK-online centres (UK 49) around the country.

Vocational training

Again, this category provides a number of examples. The Greek ESEKA initiative (Linking Education and Training with Employment) is a measure planned to improve the quality and relevance of training mechanisms. In the Netherlands, the '*Scholingsimpuls*' (Training Impulse scheme, NL 38), introduced in 2001, aims to support the development of innovative training projects for employees. Other measures in this area are Vocational Training and Adult Education 2000 (NL 20) and Knowledge exchange Vocational Training and Industry (NL 21). The Swedish Advanced Vocational Education (AVE), pilot project (SE 15) is a new form of post-secondary education which is intended to respond to needs in the employment market. In the UK, a number of measures target the vocational and technical education systems, aiming at rationalising vocational qualifications and ensuring that half of all general Further Education (FE) colleges have a Centre of Vocational Excellence; its also allocates further resources to reform and increase the number of Modern Apprenticeships between 1997 to 2004. Further investments have been made in a number of the delivery mechanisms for training such as the National Training Organisations and Group Training Associations.

Technical training for executives and engineers

Under this heading can be included the establishment by Luxembourg of its 'The Sitec' initiative, of which the objectives include: to contribute to innovation and technological development through lifelong learning and training, and the qualification of men and women, to provide training in lifelong learning. Meanwhile, in the **Candidate Countries**, the Government of Lithuania is providing funding through the Ministry of Economy to train the heads of companies and employees. This funding covers training and



consulting, improvement of qualifications, and improvement of existing professional skills and knowledge taking into account the ever-changing demands of the labour market.

Training civil servants

The Cyprus Academy of Public Administration (CAPA) is a part of the Ministry of Finance, created in 1991. Its major aim is to contribute to the efficiency and effectiveness of the civil service, through the development of the management capabilities of civil service departments. The *Public Administration and Personnel Service* (PAPS) promotes continuous training to civil servants in parallel to the training activities of the CAPA.

General training

The Norwegian Ministry of Education and Research has established a 'Competence Development Programme' to help bring innovation into the market for lifelong learning. Companies, municipalities, knowledge institutions, labour organisations and others may initiate projects under this programme. The main target groups are public and private enterprises, including the self-employed. Under the 'Evaluation systems for practical experience' (*realkompetanse*), a national system for the evaluation of practical work experience will be established by the middle of 2002. Starting in 2000, Italy has been setting aside €1.55 million each year to promote lifelong learning courses. The money is intended to finance training for workers on the basis of contractual agreements which allow for reductions in working time and direct requests for training by the workers

The Human Resource Development Authority (HRDA) in Cyprus is a semi-Governmental organisation managed by representatives of employers, unions and the Government. The training activities promoted by HRDA are designed to meet the needs of the economy, enterprises and the labour force.

Adult training

Many countries have initiatives designed to deliver adult training opportunities. The following are illustrative examples only.

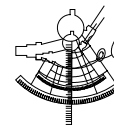
In Finland, the National Programme on Ageing Workers (1998-2002) is based on predictions of future changes in the structure of demography and the labour force. One of the aims of the programme has been to develop adult education so that it would better meet the needs of the population aged 45 and over. The Adult Education Centres in Cyprus have been in operation since 1960. They offer second-chance opportunities to adults in various subjects of education and training. Lastly, adult training is offered at all levels in the Netherlands. Regional Education and Training Centres (ROCs) have special departments for adult education.

Incentive schemes

Finally, under this particular Action, support for lifelong learning has materialised in a series of measures focused around incentive schemes, such as financial incentives or tax facilities. This type of incentive is pervasive among Member States. The following examples serve to illustrate some of the types of support employed.

Self-employment schemes

A self-employment scheme for tertiary education graduates has operated since 1983 within the Ministry of Labour and Social Insurance in Cyprus. It provides financial incentives in the form of loans and interest rate subsidies to stimulate self-employment.



Tax facilities

The Dutch '*Scholingsfaciliteit*' (training facility, NL 41) allows companies to deduct at least 20% of their investment in employee training from taxation on their corporate income. In Sweden a tax-based incentive has been proposed. Tax-deductible savings for individual learning and skills development are to be introduced from 2003. Likewise, in Spain, tax deduction schemes for training (for SMEs) have also been identified. These allow companies to deduct 5%-10% of spending on training. Tax credits for training have been broadened to include training in new technologies (ICT) from 2001.

Finally, tax deductions in Poland are available to citizens who spend their own money on education, for spending on scientific aids (including computers, software, scientific books), and on courses improving professional qualifications (including foreign languages and computer sciences).

Action 4.3: New missions for universities

Eight of the Member States and Associate States report progress with regard to this particular objective, which covers Government policies designed to encourage universities to give particular attention to the promotion of the diffusion of knowledge and technologies, in addition to the traditional "missions" of education and research (see Table 1). These seven are: Austria, Belgium (at the regional level), Denmark, Finland, Germany, Ireland, Norway and Spain. The remainder all indicate a stable position. With regard to the **Candidate Countries**, five report progress (Cyprus, Bulgaria, Estonia, Hungary and Latvia), with the rest indicating no change.

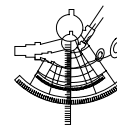
In the examples provided, two levels of intervention may be identified:

- 'generic' recognition of the need for universities to adopt a more interactive role with the business community and society, either at the national or regional level – in some cases accompanied with modifications to the legal framework governing the operation of universities, particularly those which have a relatively low degree of autonomy from the state;
- implementation of more specific measures designed to stimulate university-industry co-operation.

In some countries both types of policy have been introduced.

In Germany, an amendment to the Federal Law on Frameworks for Higher Education (*Hochschulrahmengesetz*) of 1998 added 'technology transfer' as a further mission for HEIs. Today, almost every HEI runs an office for technology transfer. The ongoing reform of HEIs (DE 59) particularly stresses the importance of knowledge and technology transfer. In addition, the BMBF and the *Länder*, which are responsible for the HEI sector, run several measures to help HEIs meet this mission. These include covering measures to support the creation of start-ups from academia, for example, the BMBF regional network initiative (DE 21), started in 1999 and enlarged to another eight to ten regions (EXIST-Transfer), in 2001. High-tech start-ups from HEIs may also apply for direct public funding under the new BTU-Early Stage programme (DE 66). The commercialisation of IP is another important issue; a special programme was started in 2001 to establish a supportive infrastructure for HEIs, either on an institutional or regional level (DE 72). Finally, the Universities of Applied Science have a separate fund for R&D projects available which should strengthen their research efforts and thus increase their relevance as a partner to SMEs in R&D projects (DE 42). This programme has received increasing funding in recent years.

In similar fashion, the main aim of the recent reform of the higher education system in Italy has been to reorganise the academic system through transforming its over-centralised structure and giving administrative and academic autonomy to each university. An important factor underlying the reform was the criticism that there was insufficient co-operation between universities and industry, and with society at large.



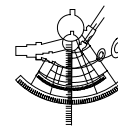
In Sweden, debate on the ways in which society should profit from the RTD carried out by universities and university colleges was codified in the Higher Education Act (1996), through an amendment that HEIs should also (in addition to providing education and performing research) co-operate with the wider society. This so-called 'third mission' brought with it an increase in activities aimed at connecting HEIs with industry in particular. However, the range of activities has expanded so much that there is now demand for better coordination and greater transparency in the system. Public initiatives in the field include the building of Competence Centres (SE 4) – joint ventures between universities, industrial firms and research institutes, and Active Industrial Collaboration, AIS, (SE 11), a programme launched in 1998, and scaled up considerably in 2000. AIS is intended to contribute to RTD-related networking projects, between small and big companies, universities, and research institutes.

Universities in Spain are autonomous bodies created and operating under the legal framework of the Autonomous Community. Thus the role of central Government is limited. However, under the new 'Law of Universities' (Law 6/2001, December 21), a new framework has been established. The law introduces important reforms in terms of the management and administration of universities, recruitment processes, assessment and improvement of quality, and also reinforces the role of universities as active agents in the economic development of their regions. However, the specific strategies for playing these new roles remain the responsibility of the universities.

The process of university reform in Austria has been continuing over the past decade. The recently drafted (and intensely disputed) new rules that will govern universities in the future will come into force on 1 October 2002. The university reform is meant to increase their autonomy substantially. This should reflect a Europe-wide trend away from state-regulated universities towards self-dependent and efficient institutions, and is hoped to improve the quality of both research and teaching and expand the international competitiveness of Austrian universities. The university reform is also designed to increase the mobility of university researchers between national and international institutions, and between the economy and academics. In order to achieve these goals, the contractual relationship for assistant professors has been changed and they will no longer have the status of public servants.

At the higher policy level, the Irish National Development Plan (NDP) 2000-2006 emphasises the importance of developing linkages between industry and the higher education sector. A number of the measures in the NDP are intended to assist the transfer of knowledge from the third level sector. The 'Third Level Incubation Centres' and the 'Regional Business Incubation Space' initiatives are examples of such measures. Similarly, a recent statement issued by the Irish Council for Science, Technology and Innovation, *Commercialisation of Publicly Funded Research* (April 2001), has recommended that universities, institutes of technology and public research institutes should view the commercialisation of R&D as an essential mission. At the practical level, the new 'Embark' initiative from the newly formed Irish Research Council for Science, Engineering and Technology (IRCSET) represents a change in funding programmes aimed at knowledge creation. The Embark programme does not target research projects with an industrial or economic focus but instead aims to support researchers in exploring ideas and bringing vision to reality. However, the shift in roles has engendered policy debate over the ways in which the third level sector can accommodate these new demands.

A similar situation is found in Finland, where the regional impact of universities and other HEIs is gaining more attention. Policy makers have discussed the regional aspects of higher education, and the Government has drawn up an action plan for the regional development of higher education through to 2006. Special emphasis has been placed on connecting development to the economic and industrial structure. Universities are also increasingly taking part in the commercial utilisation of research results. The pronounced role of universities as a source of economic growth and innovation sets new demands for the protection of intellectual property rights, and poses new challenges for academic research and university education. The Ministry of Trade and Industry, together with the Ministry of Education, has therefore set up a working group to tackle questions emerging from this new mission.

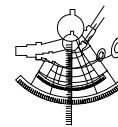


One of the major documents to be produced on higher education in Norway recently was the green paper made by the Mjøs Commission in which a more independent role vis-à-vis the Government was proposed for the state universities and colleges. The Mjøs report was followed up by a White Paper on higher education in which the Government proposed a new paragraph defining the objectives of these institutions. This paragraph now mentions the responsibility these institutions have towards industry: "The institutions have a responsibility for informing the public about their activities and for encouraging (disseminating) the understanding and use of scientific methods and results, both in the public sector, cultural life and in industry."

In 1998 Danish universities came under the control of the Ministry of Research, since which time they have witnessed a number of new research political initiatives. One of the most contentious of these is the so-called 'performance contract': an individual agreement between a university and the Ministry. From the Ministry's perspective, the main purpose of these contracts was to ensure that universities took responsibility for the active use of research-based knowledge, by developing their organisation and introducing quality control mechanisms, benchmarking and regular publishing of results. Universities were somewhat reluctant to accept the contracts in the form presented by the Ministry, mainly because, in their original form, they lacked reciprocity and implied an unacceptable level of amplified governance. The introduction of the actual performance contracts therefore did not occur until early 2000. Despite various criticisms, the performance contracts are seen as a first step towards a more flexible governance structure for the universities, and one that can improve on management structures as well. Another means to guide priorities in public research, including research at universities is the introduction of the so-called 'priority areas', which have been included in recurrent research political statements since 1993. A recurrent structural theme in these, receiving increasing priority as a priority area, has been the improvement of trades' and business' (and others) utilisation of research results. Financial resources have been allocated to encourage institutions towards closer co-operation with commerce and business.

The French Government has established a general framework intended to encourage the diffusion of knowledge and technologies by universities as well as a spirit of innovation and enterprise. Two specific examples of such measures are the Technological Research Diploma (DRT, FR 30), which promotes university staff mobility over to SMEs, and the technology platforms (PFT, FR 33) which aim at promoting and institutionalising innovation and technology transfer in public institutes dedicated to education and training, within the framework of the 3rd Millennium University Plan and the State Region contracts.

In the Brussels-Capital Region a new regional Ordinance, which particularly concerns the funding of interface services in the two major universities based in the territory of the region, provides a legal basis for university-industry co-funding, (although in practice this type of funding has existed for a number of years). Developing basic research and closing the gap between academic research and more short-term industrial research is a priority of the Flemish Government's most recent policy statement (November 2001). Although the existing GBOU scheme (BE 57) is intended to address this issue, requests from universities and industry for a stronger and more integrated initiative have recently been met and additional funding set aside. Support is also provided through the University Interfaces (BE 18) measure, the main goal of which is to encourage universities to valorise their scientific and technological knowledge. Relating to this role, in 2001, the Flemish Government approved in principal a preliminary draft of a regulatory decree concerning the conditions for the support to the university interfaces. The major changes include setting and achieving targets for the valorisation of university research. Other relevant Flemish measures are the HOBUS scheme (BE 12), launched in 1997, and the new programme for the stimulation of innovation in SMEs, launched in 2001, (BE 58). In Wallonia, the main initiatives (the FIRST programme (BE 31) and university interfaces (BE 47)) in favour of developing new mission for universities were established prior to September 2000. A similar programme to the GBOU scheme in Flanders exists, namely the 'Initiative Search' (*'Recherche d'initiative'*).



Historically, Portuguese universities have had a strong pedagogical role, although the importance of research has also been reinforced over recent years. There is now an increasing recognition of the need to foster interaction with the outside world, both with industry and also with the regions. To support this change in behaviour, several actions have been introduced, although they are not directed solely at universities. These include the placement of researchers in companies and technology centres (PT 22), the POCTI/POSI measure on R&D activities by consortia (PT 21), the POE measure on mobilising programmes for technological development (PT 23) and the creation of the Industrial Property Support Office – GAPI (PT 26). Attention has also been focused on the importance of university-industry co-operation through the *Jornadas de Inovação* (Innovation Days) promoted by AdI, the Innovation Agency, which demonstrated the outcomes of 120 projects. AdI has also released a report on the R&D consortia supported under the PRAXIS XXI and the IC-PME programmes which showed that the large majority of these consortia were university-industry co-operations.

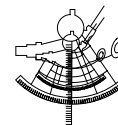
Greek universities are strongly encouraged to go beyond their teaching missions and not only engage in research but also to provide technological services and launch spin offs. Hence, the criteria for funding in HEI support schemes generally include the relevance of research for the national technological goals. Examples include Excellence funding, (GR 49), the new design of the academic research support - PENED, (GR 41) and the function of the Liaison Offices (GR 10). The most recent measure in this context is AKMON (GR 43), which aims to improve the equipment provision of those laboratories that co-operate intensively with industry (the measure is not yet operational).

The UK Government clearly identified its desire for universities to diversify from their traditional missions of research and teaching when it implemented the Higher Education Reach-Out to Industry and the Community (UK 22). This fund came into operation in 1998 and was intended to encourage higher education institutes to develop their links with local and regional industries and businesses, not just in terms of improving the transfer of results but also in developing more appropriate training strategies and in seeking other mutually beneficial partnerships. In 2000, HEROBIC was superseded by and incorporated into a new Higher Education Innovation Fund – HEIF (UK 38). This is intended to effectively treble its size by 2003-04 and become a permanent ‘third stream’ of funding for universities alongside the existing ‘dual support’ system provided by the Research Councils and the Higher Education Funding Councils.

In Luxembourg, one of the conclusions of the ‘White Book on higher education and research’ concerned ways in which the current system could be made more competitive. As a consequence, under the framework of the ‘*Cité des sciences*’, researchers and lecturers will be given the opportunity to create their own firms, and their interactions with start-up centres encouraged.

Little activity with regard to ‘new missions’ for universities is reported in the **Candidate Countries**, other than a number of specific measures designed to support co-operation with industry. Examples include the long-standing Hungarian measures: HU 01 (Applied R&D) and HU 15 (Call for proposals to foster regional co-operation of chambers in the field of R&D) – now concluded. The Ministry of Education is supporting the establishment of Co-operative Research Centres for the formation of links between institutions of higher education, other non-profit research institutions and the business innovation sector.

Although there is not yet an entrepreneurial culture in Romania, the Government, educational institutions and SMEs realise the need for action in this area. As part of a general overhaul of its educational policy, the Government is therefore reviewing its priorities in the area of entrepreneurship. The policy for 2001-2004 includes a number of specific priorities which aim to strengthen the links between the educational system and enterprises. They focus on the development of university-enterprise co-operation, the adaptation of academic qualifications to the needs of economic development and the consolidation of academic, administrative and financial management at university level.



Action 4.4: Technology transfer by large public research facilities

An examination of Table 1 reveals that, of the **Member States and Associate States**, only Austria and Germany have reported any progress towards putting in place measures to encourage large public research facilities to benchmark their activities in technology transfer and partnerships with enterprises. With regard to the **Candidate Countries**, progress is reported for Estonia and Latvia only.

Many of the reported examples of benchmarking concern the use of evaluations, either by an independent agency or on a self-assessment basis. Such evaluations may be conducted on a formal basis (i.e. required by legal frameworks) or on a more informal basis, for example, as part of an innovation survey.

Formal arrangements

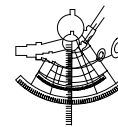
In recent years, in the operating context of PSREs and similar bodies in the UK, the profile of technology transfer and relationships with industry has been raised. All such bodies have, for some time, been subject to five-yearly (quinquennial) reviews. The object of these is to evaluate the effectiveness of their operations, aims, and objectives, specifically within their relationship to their parent government department. Therefore it is highly likely that evaluations of the performance of these large public research facilities will include judgements based on their degree of interaction with businesses. In 1998 the Government commissioned a study of the links between research and innovation at PSREs. An interdepartmental action plan formed one of the consequences of this review. This sets out a range of measures to support PSREs in their mission to exploit the results of their work. The action plan is set out in full in the Government's response to the Baker Report¹⁰.

At the beginning of the 1990s, the Science and Technology Policy Council of Finland, a committee advising the Government in science and technology policy, suggested that all public research institutes and universities should be evaluated. By the end of the decade, the first evaluation round of the large public research facilities was completed. During the last few years, evaluation interest has been shifting from individual measures and institutions to a more comprehensive systemic level, working on a broader innovation support infrastructure. Recently, VTT Technical Research Centre of Finland, the largest Governmental research institute in the Nordic countries, evaluated the impacts of its R&D activities. According to the study, the majority of VTT's partners were satisfied with collaboration and estimated that VTT's research work had improved their competitiveness.

Since 1995, all German Public Sector Research Establishments co-financed by the Federal Government have undergone evaluation by the Scientific Council, including the Fraunhofer-Society, the Max-Planck-Society, the Helmholtz-Association of German Research Centres, and the Institutes of the Leibniz-Association. The results showed that the Fraunhofer-Society can be regarded as a role model for the efficient organisation of R&D and technology transfer to industry within one organisation. The Max-Planck-Society has proved to be a highly productive scientific organisation with a large number of top-quality scientific research results that are highly regarded in the international community, and thus fully meets its mission; The institutes of the Leibniz-Association showed a high degree of variation in their performance – institutes with weak performance underwent cuts in funding, and some were downgraded to non-scientific institutions. The Helmholtz-Association, the largest single institution among German PSREs, received some criticism due to its low record of technology transfer activities given their size and their near-to-application R&D activities. As a result, reforms in the PSRE sector (DE 58) have mainly addressed the latter institutions, and one of the Association's research centres (on information technology) has been merged with the information technology activities of the Fraunhofer-Society.

Public laboratories in Portugal are subject to the regime laid down by Decree-Law n^o. 125/99, of 20 April 1999, under which technology transfer and partnerships with industry are theoretically

¹⁰ *The Government's Response to the Baker Report "Creating Knowledge-Creating Wealth": Realising the Economic Potential of Public Sector Research Establishments*, Office of Science and Technology and HM Treasury, Cabinet Office. July 2000.



encouraged. An evaluation exercise undertaken in 1998 had allowed some benchmarking of best practice in this regard; however, apart from this, there seems to be no systematic benchmarking activity.

In Belgium there appears to be no systematic policy towards the benchmarking of the activities of large public research facilities with respect to technology transfer and partnerships with enterprises, although two studies have recently been carried out on spin-offs from universities and public or publicly funded research organisations. At the Federal level, all Federal research organisations are subject to an evaluation process, but this focuses on scientific performance as opposed to interaction with enterprises. However, at the regional level, in Flanders, there is an emphasis within the 'management agreements' between the Flemish Government and the two large independent research organisations (IMEC and VIB) on including performance criteria related to interactions with the Flemish economy. As an example, the agreement concluded between IMEC and the Flemish Government for the period 1997-2001 foresaw a series of indicators that facilitated the benchmarking of IMEC's activities in technology transfer and partnerships with enterprises. These indicators included: the income from contract research; the ratio between own income/grant, co-operation and contract research with Flemish enterprises; co-operation with universities and polytechnic schools; number of publications, conferences and presentations; number of demands for patents and number obtained; number of spin-offs created; attraction of foreign investments; and the availability of expertise.

In general, Danish public research facilities are either affiliated with universities or sector research institutes (i.e. research institutes affiliated to the various ministries). As such they are engaged in performance contracts with the Ministry. Few of these sector research institutes comprise large research facilities. As one particular example, the Risø National Laboratory, in accordance with its management performance contract, is obliged to take part in an evaluation conducted by an international panel. The outcome of the evaluation also forms the basis for negotiating renewal of the contract.

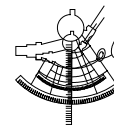
Informal arrangements

Although there are no specific measures in France that encourage large public facilities to benchmark their activities in technology transfer and partnership with enterprises, the Government encourages benchmarking in a general way. For instance, the Ministry of Research has carried out a comparison of the relationship between the research actors and industry, intended to evaluate (amongst other things) the performance of large public research organisations.

Large public research facilities outside the universities, are few in Sweden. The most important of these research facilities include the 30 or so industrial research institutes. These, however, are semi-public (Government funds about 40% of the budget). The institutes carry out research in technological fields such as ICT or in relation to specific industries (e.g. pulp and paper). Thus, the transfer of knowledge to enterprises is not a major issue since a very large part of their R&D is commissioned by industry. Nevertheless, the Government has supported a study of six institutes aimed at benchmarking their technology transfer to SME.

In Austria, there are no efforts to benchmark the activities of large public research facilities on an international scale. When some years ago the Austrian Research Center Seibersdorf compared itself with comparable institutions abroad (e.g. VTT in Finland), this exercise was not implemented as standard practice.

The Norwegian Ministry of Education and Research has recently commissioned a study from the STEP-group, which sets out to map the patenting and licensing activities of selected Norwegian knowledge institutions, including public research institutes. The study is part of an OECD study of intellectual property rights.



No arrangements

The remaining countries report no arrangements for benchmarking of public research facilities. To qualify this, in the case of Ireland, issues relating to the transfer of technology by large public research facilities do not arise because the country lacks any such entities. However, in this regard the newly formed Science Foundation Ireland (SFI) has undertaken a project to benchmark basic research in third level institutions (Universities and Institutes of Technology) in order to provide a base-line measure against which it can measure the future performance of its funding activities.

Few arrangements are in place in the Candidate Countries which seek to benchmark the technology transfer activities of large public research facilities. The limited examples provided are:

- In Romania, the General Direction for Technology and Innovation of MER has established a web-based interface to catalogue the results of the research activities undertaken between 2000-2001 from public funds that can be applied in the socio-economic environment.
- In 2001, Slovenia launched a technology-mapping project in an effort to match business capabilities with university and research capabilities. This is a two-year project, and is expected to provide a basis for programmes to encourage technology transfer from public research facilities to industry.
- A survey of 230 Bulgarian firms, made by the Centre of Economic Development and presented in its Annual Report 2001 "Competitiveness of the Bulgarian economy" concluded, amongst other things, that the level of co-operation between universities and businesses in terms of the launch of new products, etc., was very low.

Objective 5: A society open to innovation

Action 5.1: Stakeholder debates on innovation

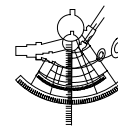
According to Table 1, seven **Member States and Associated States** report progress against this specific Action (Austria, France, Germany, Luxembourg, Norway, Portugal and Sweden). The rest indicate a stable situation. Most countries appear to have some type of initiative aimed at the promotion of stakeholder discussion or at the broader objective of raising public awareness of innovation. Specific examples are provided below, although no overall trends or patterns can be detected other than some Governments explicitly promote debate on innovation issues whilst others are less active. Several Governments are also sponsoring or organising so called 'Science Years' or 'Science Weeks', although these are less concerned with innovation, *per se*.

States indicating recent progress

The Austrian Government has recently devoted two of its Reform Dialogues to matters of innovation policy. These events bring together stakeholders from the fields of politics, science and business. The main issue concerns the presentation and discussion of strategies to achieve Government's goal of increasing R&D spending to 2.5% of GDP. As part of the debate, the Council for Research and Technology Development presented the '*Forschungsstrategie Austria*' (Research Strategy Austria) which outlines the proposed fields of action for achieving this ambitious objective in an online form.

Many different national forums on innovation take place regularly in France and a number were held towards the end of 2001 and in early 2002. Notable recent examples are listed below.

- The AFAV (National Association for the Analysis of Value) Congress organised (together with ANVAR and CNES – the French Space Agency) on the topic of communications, with debates on themes such as valorisation and innovation management;
- The Regional Forum of Scientific and Technical Culture, organised by the National Assize of Scientific and Technological Culture. The forum consisted of workshop debates on: Scientific



and Technical Culture and daily life; Science and Technology in the citizen's debate; Scientific, Technical and Industrial culture and the working environment; Technical and Industrial Developments and the global economy; Scientific and Technical culture in education and training;

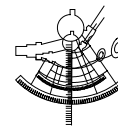
- Workshops on Innovation: Managing Research and Innovation, organised by the National Association of Technical Research (ANRT);
- Second International Forum for the Management of Research, Innovation and Technologies: organised by the Ministry of the Economy Finance and Industry, the Ministry of Research and the financial newspaper *Les Echos*;
- Capital IT, organised by ANVAR. The event was organised as a meeting point for SMEs, European venture capital investors, industrialists, IT and biotechnology analysts, consulting companies and representatives of academia.

The Portuguese initiative PROINOV has actively stimulated stakeholder debates on innovation. These have taken place in two main contexts: thematic Workshops on issues relevant for innovation policy and competitiveness; and the development of clusters. Several thematic Workshops have been held, providing forums for debate among companies, researchers, technology support organisations, industrial associations, regulatory bodies and policy makers. Six Workshops were held up to the end of March 2002, dealing with: Innovation policies and the digital economy; Financial innovation in the digital economy; Partnerships for innovation – fostering Industry-Science relationships; Innovation diffusion policies; The image of Portugal; and Design for innovation. The experience so far has been very positive. Reference should also be made to two other initiatives which encourage public debate on innovation: *Jornadas de Inovação* (Innovation Days), organised by AdI in Oporto; and the INETI Week, promoted at INETI's premises in Lisbon

The German Federal Government actively encourages comprehensive stakeholder debates on innovation involving scientists, industry, consumers and public authorities. A significant instrument in this respect is the FUTUR project (DE 35), which is designed as a continuous foresight process involving actors from all parts of society. Its aim is to identify and discuss future themes for innovation and technology development in Germany. There are also a number of other awareness measures that include stakeholder involvement and which should stimulate debate on innovation. Biotechnology and genetic engineering is an area of intense public discussion – the BMBF initiated 'Science live – science in dialogue' (DE 37) which provides a forum to discuss the future of these topics. Within the INSTI-network, two projects are especially designed to raise the awareness of pupils and students about innovation: the INSTI Inventors Clubs (DE 47) and the INSTI-School Action 'Tour d'Innovation' (DE 39) which concentrates on teaching students about various aspects of innovation.

Luxembourg has a long tradition of developing consensus between all the stakeholders in research, a principle which is scrupulously applied in the field of innovation. Recent examples of measures to implement this goal are the 'e-Luxembourg' project (a collection of projects which aim to facilitate and speed up the entrance of Luxembourg into the Information society) and to contribute directly or indirectly to the emergence and the stimulation of an innovation spirit, The innovation portal, which aims to 'democratise' the concept of innovation, (primarily among companies, but also to the general public), and the Innovation Observatory, which will also target a very large public audience.

In Sweden, the Government has scheduled a number of meetings during the spring and summer of 2002. At these meetings policy makers and representatives of science, industry and trade unions will discuss the ways in which innovation and economic growth may be promoted. Also, a new foresight exercise is planned for the second half of 2002 and the beginning of 2003. This exercise will also be used as a means to stimulate stakeholder debate on innovation.



Countries reporting a 'stable' situation

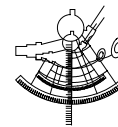
Debates on innovation in Ireland have typically involved Government, industry and academia. This is typified by the composition of the Irish Council for Science, Technology and Innovation (ICSTI) with membership drawn from state development agencies, industry and education. However, currently no forum exists where other stakeholders such as trade unions and consumers may contribute to debates or consensus conferences on Irish innovation policies. The Office for Science and Technology within the Department of Enterprise, Trade and Employment funds the STI Awareness Programme (IE 16) which aims to increase awareness, understanding and support for science, technology and innovation in business, education, policy makers and the public. It should be noted, however, that STI Awareness Programme is designed as its name implies to create awareness of S&T among stakeholders rather than debate on innovation.

All Belgian authorities have either institutional mechanisms (Science and Technology Councils) for delivering opinions on their science, technology and innovation policies, or have supported exercises such as RIS with a view to encouraging a broader debate. The Federal, Flemish and Walloon Science Policy Councils existed prior to 2000, while the Brussels-Capital region Science Policy Council was only created in 2000. Since September 2000, the Flemish and Walloon Councils have issued a number of opinions or commentaries on both EU level policies and regional level measures or policy documents. In terms of specific measures in favour of raising public awareness and stimulating a debate, there has been no significant change in the policy measures that existed before September 2000. In Flanders, the Technopolis Science Centre is responsible, under a contract with the Science and Innovation Administration of the Flemish Government, for the majority of the awareness raising events in Flanders as part of the combined 'Action plan on science information and innovation'. Also in Flanders, the new Science and Innovation Ministry will include in its structure a specific service for science popularisation and a Flemish Agency for Science Information will be created. In Wallonia, a service of the DGTRE is responsible for managing and coordinating a series of initiatives in favour of the diffusion of science and technologies (BE 54).

One of the aims of the Danish project on Technological Foresight (DK 12) is to stimulate dialogue between trade and business, the innovation system and stakeholders in general. The programme is planned to run between 2001-2004.

The Spanish Government is encouraging debate on innovation in society through several initiatives. For example, the IVth National R&D Plan incorporates some instruments devoted to the dissemination of scientific and technological advances throughout society (Special Actions scheme, ES 20) and the Ministry of Science of Technology has a programme of grants for diffusion activities related to its own policy goals and competencies (ES 26). The Ministry also promotes and organises a set of yearly Forums and Seminars, such as the "Patents and Innovation Forum" promoted by the Spanish Office for Patents and Trademark (OEPM) and the "Forum for industrial competitiveness and innovation", an annual meeting for different agents and actors in the Spanish innovation system. In order to encourage public interest in science and technology a new diffusion activity – the Ministry has launched a 'Science Week' initiative at the end of 2001, which involves a series of conferences, seminars courses, round tables and public debates. In addition to the efforts developed by the Science and Technology Ministry, a number of other bodies have attempted to encourage technological culture and public debate in Spain. Examples include the COTEC Foundation Supporting Technological Innovation, and the Spanish Foundation for Science and Technology (FCYT). The latter specifically aims to foster an innovation culture in Spain through its activities.

The UK Government (specifically the Department of Trade and Industry, DTI) is actively encouraging stakeholder debates on innovation. A range of activities and events are organised, either annually or on an *ad hoc* basis, with other bodies such as Trades Unions, scientific societies, the Confederation of British Industry. Of particular note are the Annual Innovation Lecture, organised by the DTI, and publications such as the R&D and Capex Scoreboards, which are intended to stimulate debate and awareness of innovation issues at a broader level.



The need to promote better awareness of inventive and innovation activity has been recognised on a general level in a number of recent evaluations in Finland. One concrete measure aimed at raising the awareness of R&D and innovation among the public is the organisation of various competitions and prizes for successful new and fast-growing firms, inventors, or innovators. The most significant of these measures is the INNOSUOMI initiative.

Norway also has a history of stakeholder involvement in policy issues. As a recent example, in the context of Norwegian Government's planned reorganisation (of the Norwegian Industrial and Regional Development Fund, SND, the Industrial Development Corporation of Norway (SIVA), the Trade Council of Norway, the industry-oriented parts of the Research Council of Norway, and other topics), the Ministry of Education and Research arranged a conference for stakeholders in January 2002 in connection with the evaluation of the Research Council of Norway. This is a so-called open process, where the Ministry asked various relevant public institutions, counties, companies and industrial organisations to voice their opinion on the future of the Norwegian industry policy instruments. All these contributions have been published on the Internet, together with a series of background reports.

The Italian Government "takes part" rather than "encourages" comprehensive stakeholder debates on innovations. However, the Industrial Associations are very active in encouraging public discussion on the weaknesses of the Italian system and on its relevant needs. An example is the benchmarking exercise undertaken by Confindustria¹¹.

Similarly, although no direct Government is reported in Greece, the Greek industrial federations (Countrywide FGI and the Federation of Industries of Northern Greece) participate actively in the debate on national competitiveness.

In comparison with the above countries, fewer of the **Candidate Countries** report progress against this objective (Cyprus, Bulgaria, Romania and Slovenia – see Table 2). A stable situation is reported in the other countries.

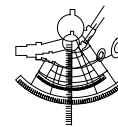
Slovenia appears to be a leading example in the promotion of public debates and fostering awareness, with the Government providing a wide range of programmes. Examples include the annual award for achievement in science and technology, business plan competitions, and sponsorship of television shows promoting entrepreneurship and innovation. One programme (the title of which translates as 'Little Brain Cells') targets primary school children and is intended to push children to think differently and inquisitively about science and innovation.

Although there have been no further cases of public discussions regarding the theme of innovation in Estonia since the debates over creating an 'Estonian Nokia' in early 2001, there has been a programme of seminars concerning the topic of innovation policies in the context of EU Accession, arranged by the Ministry of Economy last autumn (2001). These were attended by representatives of the political, business and research communities. These events were policy-oriented, discussing the roles of all parties in the development of innovation policy.

An example provided for Cyprus cites the RISC programme. A number of discussion presentations have been given concerning the introduction of the programme to innovation-related bodies. The programme's working groups are now organising debates in order to gather feedback for the design of innovation strategy in Cyprus.

In Hungary, the Mecenatura programme (HU 04), launched in August 2001, contains a sub-programme aimed at raising the awareness of the larger public (particularly students) in regard to

¹¹ <http://www.confindustria.it/DBImg2002.nsf/HTMLPages/Bench>



innovation activities. Mecenatura has supported R&D related TV programmes, magazines and student competitions.

Some states report the utilisation of the Internet as way to provide information concerning innovation developments. Thus in Bulgaria, 'Dialogue 2001'(which can be found on the Government's home page) offers the public and businesses an opportunity to take part in public debate. Other websites provide details of ministries and structural and functional information on administrative bodies, together with information on services offered such as taxes, etc. However, periodicals, specialised magazines, bulletins, etc. are also important means of disseminating information. Similarly, in Romania raising public awareness has mainly been done through development of a website for the Ministry of Education and Research¹². This presents information on new programmes, tenders, Government strategy, etc.

While Latvia and Slovakia have not reported any measures to support this Action, Government strategies indicate the perceived importance of this area as a policy focus.

Action 5.2: Public administration purchasing policies

For the purpose of this analysis, public administration procurement is taken to refer to the purchasing of goods and services, of a high technology or knowledge-intensive nature, in order to stimulate innovation in the domestic providers of those goods and services.

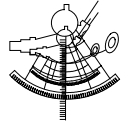
Several countries among the **Member States and Associated States** have provided general examples in aerospace and defence as areas where government intervention may influence the performance of industrial sectors. For example, while State procurement as a means to foster innovation is not at the centre of the German Federal Government's innovation policy, public demand is a major driving force for defence related R&D, and the Federal Ministry of Defence spends about €1.1 billion a year for R&D in the defence industry. Similarly, the French public administration has a purchasing policy that can exert a positive effect on Research and Technology in some fields such as aircraft industry or defence. The collection of data on this type of activity, however, exceeds the available resources of this study.

However, the use of state procurement as a means of fostering innovation is open to question. First of all, it is unclear why the state should have more information on future demand for new products, services and processes than the sum of all other economic actors¹³. It is more likely that states will follow idiosyncratic behaviour and demand technical solutions that do not meet market trends and preferences of customers. Furthermore, public demand may lead to national technical solutions and thus impede exports. Therefore, firms that rely heavily on innovation impulses that stem from public demand may be hampered in the market success of their innovation. Analyses of the effect of public demand on innovation success, based on the ZEW innovation survey in 1999, reveal the truth of this hypothesis. There is no significant effect upon the sales of new products if the respective innovation impulse stems from public administration (including the public health and education sector), although the demand side as a source of innovation can exert a strong and positive influence on innovation success (see Beise *et al.* 2002¹⁴). An indirect way of stimulating innovation, conceptually connected to the idea of dynamic purchasing policies involves the use of regulations that perceive forthcoming trends at an early stage. There is evidence, for example, that the German Government could do more to stimulate innovation in environmental technologies by making an early adoption of stricter regulations on waste emissions.

¹² <http://www.mct.ro/>

¹³ Rammer, C. *European Trend Chart on Innovation, Theme-specific Country Report: Germany*. April 2002.

¹⁴ Beise, M., Cleff, T., Heneric, O. and Rammer, C. (2002): *Lead Market Deutschland. Zur Rolle Deutschlands als führender Absatzmarkt für Innovationen*. Studie im Auftrag des BMBF. Mannheim: ZEW.



This hypothesis appears to receive some backing from the Netherlands. In 1997, the Ministry of Economic Affairs introduced its cluster policy. This reflects the Cabinet's notion that co-operation and network creation between companies and research institutes is essential to the innovativeness and competitiveness of companies. The policy conceives of three roles for Government, one of which is to stimulate public demand for innovation by acting as a demanding customer. Yet, in practice this role has been rather limited and there are few examples of projects in which the Government acts as a demanding customer.

Having noted this, there are a number of activities reported under this particular heading, although only two countries note progress since the publication of the Commission's Communication – Luxembourg and the UK (see Table 1). The remainder generally report a stable situation or are unable to provide information.

Overall, three types of public procurement policies emerge from the data provided: those dealing with R&D in specific sectors (other than aerospace and defence), those dealing with SMEs and those under the general heading of the Information Society and the use of electronic services. Finally, some countries actively do not pursue such policies – there is reluctance among policy-makers in Ireland to consider such policies, as they are perceived as being potentially contrary to EU public procurement regulations.

Sector specific

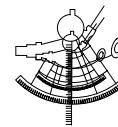
In Belgium, some limited initiatives, notably in the area of solar energy or clean combustion engines (buses, electric cars, etc.), have been taken to stimulate new technologies. A further, possibly relevant, measure is the project for the creation of a Joint Electronic Procurement (JEP) system which would replace the current procedure by an entirely electronic data exchange.

Recent Danish Governments have recognised the IT and telecommunication field as a high priority policy area. Political statements on ICT have repeatedly emphasised the importance of strengthening public sector use of ICT including the Internet. The purpose has been – apart from facilitating communication between the private and public sector – to stimulate an increased use of these technologies, thereby stimulating innovations and development of technologies and applications for the service and knowledge society.

In Finland, the Macro Pilot project, under the 'Well-Being Cluster' programme, is an example of an activity that aims to stimulate public demand for innovation. The goals of the project have been to develop client-centred, seamless and effective services in the social and health care services sector by using and developing new technological solutions and devices.

In Italy, one of the most recent examples of public demand for innovation is the 'Operational Programme for Security' for 2000-2006. This programme arises from the Community Support Framework which sets out the development strategy for Italian Objective 1 regions. The programme contains two priorities, one of which "the development and technological adaptation of security information and communication systems" applied to the specific area of law enforcement practices.

Two important initiatives in the late nineties concerning this area are the Swedish Delegation for Sustainable Technology and the energy technology procurement initiative of the Swedish National Energy Administration (STEM). The technology procurement of the Swedish National Energy Administration aims to promote energy-efficient and low environmental impact products. Procurement is often conducted in the form of a competition between manufacturers.



SME specific measures

In the United Kingdom, the only type of measure, which might be classified as a public administration purchasing policy aimed at stimulating public demand for innovation, is the Small Business Research Initiative (SBRI) (UK46). This aims to encourage more high-tech small firms to start up, or to develop new research capacity and was inspired by the US Small Business Innovation Research Fund. Under the scheme, Government departments and the Research Councils open up R&D procurement programmes to small firms.

In a similar example, in Norway, the SND administers the OFU instrument (NO 01) on behalf of the Ministry of Research and Industry. The OFU instrument (*Offentlige forsknings- og utviklingskontrakter* – Public research and development contracts) is intended to stimulate public institutions to co-operate with companies in developing new products or services.

Electronic services

The Public Procurement Portal, launched in Denmark in January 2002, is an electronic marketplace accessible to public purchasers and their suppliers. This portal makes it possible for all the participants to integrate their data on purchase, sale and payment with their economic management systems. The first public procurement portal in Europe, it is developed, owned and operated by a private consortium.

The example provided for Luxembourg is the 'e-Luxembourg' initiative. Rather than a direct procurement programme, however, this collection of projects appears to be aimed at stimulating a broader public demand for e-services and for the associated products of the information society in general.

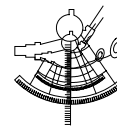
Likewise in Austria, the use of E-commerce – and particularly e-procurement – is seen as a way to help the Austrian Government improve its way of doing business by reducing transaction costs and getting better value for money. The statute concerning electronic signatures (dated 1 January 2000) opened the way for new purchasing policies of the Government. A further step was the implementation of two directives in 2001 concerning public procurement which include instructions for the removal of legal barriers impeding e-procurement.

This is a theme to be found in other countries. For example, in Portugal, public administration purchasing policies are envisaged by both POCTI and POSI as important vehicles for promoting innovation. The digitalisation of the Public Administration, and an increased use of e-commerce, is viewed as an instrument for diffusing the use of information technologies and for encouraging the development of the Information Society. More specifically, one of the actions mentioned in the Internet Initiative (PT_17) is the "reformation of State Purchasing Central services in order to promote the acquisition of goods and services through electronic means". Launching large public projects is also envisaged as a tool for stimulating R&D activities; indeed, support for the integration of R&D opportunities in large public investment programmes is one of the main actions included in Measure 2.3 of POCTI. PROINOV is also concerned with the use of public purchasing to stimulate innovation and topic III.8 of PROINOV focuses on "driving public procurement to vitalise innovation in critical areas".

In a similar fashion, the Spanish Government's initiative Action Plan INFO XXI (2001-2003) includes several measures to encourage the Information Society in Spain. The Central and Regional Governments will allocate important investments in the purchasing of Information and Communication infrastructure and technology. These investments will be utilised in key sectors such as health, education, industry, libraries and public administration.

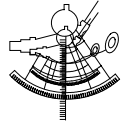
Table 2 indicates that of the Candidate Countries only Romania has exhibited any progress towards this specific objective (no examples were provided to substantiate the indication of reported progress for Cyprus). The example provided for Romania concerns the 1 March 2002 launch of an e-procurement system (www.e-licitatie.ro) by the Ministry of Communications and Information

European Trend Chart on Innovation



Technology. The measure ensures that the majority of public institutions will publish their purchasing and supply needs via web-based tenders, thereby improving the transparency of the public tendering system. This should benefit the private companies that form the suppliers of goods and services to the Romanian public institutions.

Apart from this case, there are no other examples of dynamic purchasing policies in public administrations among the Candidate Countries.



3. Overall conclusions

The scope of the Commission's 2000 Communication is too broad to be able to draw a coherent picture of its impact across such a diverse range of countries as represented by the Member States, Associated States and Candidate Countries. To attempt to do so would be to ignore both the complexities and subtleties of the innovation process itself and the contextual variation in the countries involved. However, it is possible to make some general points regarding the information that has been collected in this exercise.

3.1 General impact

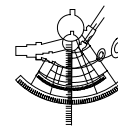
Policy documents such as the Communication and other outcomes of the overall Lisbon Process may have an impact on national (and regional) innovation policies at three broad levels:

- by increasing the 'visibility' of innovation among policymakers;
- by identifying gaps and opportunities within the existing policy framework;
- by providing a catalyst for specific new policy initiatives with defined actions and targets.

Although, few policy documents make explicit mention of the Communication, the broader 'Lisbon process' is often identified in Government policy declarations, providing a framework for innovation and technology policy in particular. Thus, the Communication, may be said to have been influential as part of a broader political impetus. There is also circumstantial evidence to support this.

It can be argued that the Communication forms part of a circular exercise which, having identified the main innovation policy priorities and practices of the leading innovative nations, then seeks to promulgate the use of these practices by a wider set of actors. Therefore, it comes as no surprise to note that Europe's leading innovative Member States (such as Germany, the Netherlands, Sweden and the UK) have policies already in place which are closely aligned with the content and objectives of the Communication. This is not necessarily negative, as countries whose higher level of innovation awareness and policies are closely attuned to innovation may still benefit from sharing their experience in the use of more specific innovation policy measures and approaches, whilst countries further removed from the leading edge of innovation policy may reap benefits from the more general lessons outlined by the Communication. This latter case is exemplified by evidence which suggests that the Communication has been influential in the design of recent policy instruments by those Member States that may be termed 'lagging'.

In the Candidate Countries, despite a more intensive need to develop policies that address more basic economic and social requirements, the Communication appears to have had some impact in terms of raising the profile of innovation and in defining some of the broader areas, and in some cases, it has led to policy instruments necessary for developing innovative capacity. However, this is a general statement and it must be noted that perhaps as wide a variation exists in the innovative capacities of the Candidate Countries as it does between the Member States.



3.2 Objective 1: Coherence of innovation policies

Action 1.1: Best practice in innovation policies

Although many countries report they have made progress against this Action, most Governments do not appear to have any specific policy for monitoring 'best practice' in innovation policy. This makes it difficult to identify precise examples where national Governments take account of best practices in innovation policy: Most monitoring activities are usually undertaken on an *ad hoc* basis. Nonetheless, there is evidence of good 'general awareness' of best practices from other countries and coming from external reports commissioned by the European Commission and OECD. The examination, by policy makers, of the use of tax credits to stimulate industrial innovation in other countries provides a good example of this awareness. While there were few reported examples of the transfer of best practice between regions by Governments, there were clear indications that this had occurred.

Action 1.2: Innovation policy coordination mechanisms

Many countries also reported progress in this area. Several examples of national and regional innovation coordination mechanisms were encountered, not only in the federal states (such as Spain and Germany) but also in the more centralised states. Similarly, a number of countries report they have mechanisms to ensure the coordination of innovation policy. These tend to take the form of:

- a high-level coordination body (Prime Minister's office, for example);
- clearly defined shared responsibilities and good channels of communication between departments whose remits overlap with regard to innovation; or
- the establishment of a lead department or ministry for innovation matters.

The joint departmental publication of high-level innovation policy papers and statements may also be practised. The roles of science and technology councils have also been enlarged sometimes to cover innovation issues.

However, the issue of innovation policy coordination has been highlighted as problematical in some countries, particularly where the portfolios of ministries and agencies overlap. In such cases competition over funding may exacerbate the problem.

Action 1.3: Monitoring and evaluation of innovation support

Again, many countries have exhibited progress in line with this action. The use of assessment, monitoring, evaluation and related activities has been broadly accepted, although to different degrees throughout most of the European Member and Associate States for several years, and has been progressively developed to meet changing needs and pressures. The use of evaluation and monitoring procedures also appears to be strongly linked to the existence of a national 'evaluation community', often located within the academic and research communities, and an 'evaluation culture'. For a number of the Candidate Countries it is too early to assess the results of any periodic monitoring and evaluation-like activities.

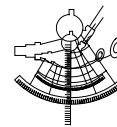
3.3 Objective 2: A regulatory framework conducive to innovation

Action 2.1: Diffusion of results from publicly funded research

Once again, significant progress appears to have been made in this area, much of it building on developments that predate the publication of the Communication.

A range of measures has been adopted in order to achieve this goal (diffusion of results from publicly funded research) and these vary considerably by target and mode of action. The following main types of initiative may be observed:

- project-based co-operation (e.g. Portugal, Greece, Belgium, UK);



- IPR handling and framework arrangements (e.g. Sweden, Portugal);
- IPR regulatory reform (e.g. Belgium, Denmark, Spain, Norway, Germany, Sweden, UK);
- institutional reform (e.g. Germany, Spain, Ireland);
- financial support (e.g. UK, Germany, Austria, Luxembourg);
- financial assistance for start-ups (e.g. Germany, Greece);
- innovative networks support (e.g. Luxembourg, Germany);
- entrepreneurial awareness raising (e.g. Germany, UK);
- mobility schemes (e.g. Belgium, Spain, Sweden);
- co-operation liaison support (e.g. Portugal, Greece);
- direct diffusion of the results of public research via government (e.g. France).

Some countries (e.g. Germany, Italy and France) also have high-level initiatives that may include – or influence – several of these types of measure.

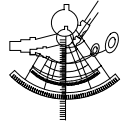
With regard to the Candidate Countries, three of these may be classified among the leading group in terms of innovation policy development (Czech Republic, Estonia and Slovakia), and they report an increase in activity along this action line. However, several states identify this aspect of innovation performance as being particularly weak.

Action 2.2: Fiscal measures to encourage innovation

The use of fiscal measures is a relatively mature policy in several countries. However, more recently, a number of states have been reviewing this type of measure with a view to modifying, continuing or discontinuing its use, depending on the particular current national situation. It is certainly an area of innovation policy which continues to attract considerable policy debate.

Countries using fiscal incentives include Belgium, the Netherlands, Austria, Italy, France, Luxembourg, Greece, Spain (at a general level), the UK and Norway – however, their experience with their effectiveness is mixed. Portugal shows a trend towards their increased use, and debate on the extension of fiscal measures to promote R&D continues in Germany. Fiscal instruments are not considered an important instrument for the promotion of innovation in Denmark, Sweden and Finland. Ireland is undertaking studies on the benefits of the approach as an incentive to investment in R&D by companies.

In the Candidate Countries, the use of fiscal measures appears to be a relatively well-used instrument used by the governments either generally to stimulate the economy or specifically to promote innovation in industry. Their use appears to be increasing in Bulgaria, Estonia, Hungary, Latvia and Lithuania, but declining in Cyprus and Poland.



3.4 Objective 3: Encourage the creation and growth of innovative enterprises

Action 3.1: Favouring the creation and development of start-ups

A great deal of activity has been reported regarding this action, much of which again predates the Commission Communication, and this topic represents an area of policy priority for many countries. This situation applies to both the Member and Associate States and to the Candidate Countries.

The types of measure adopted to achieve this goal vary considerably by mode of action and include:

- provision of venture capital,
- promotion of university spin-offs,
- support for young entrepreneurs; and
- a range of other schemes, such as tax incentives, awareness raising and information support.

The provision of venture capital funding has for a number of years been an innovation policy priority in countries such as Germany, the UK, and Belgium, while its importance has been more recently recognised in countries such as Portugal and Greece. Similarly, the promotion of university spin-off enterprises is another long-standing instrument in many countries. The promotion of entrepreneurship (rather than support for entrepreneurs) is a newer policy priority. Similar types of measure may also be observed in the Candidate Countries.

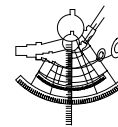
Action 3.2: Innovation support structures and services

This action is concerned with fostering regional level creation or reinforcement of adequate support services and structures such as incubators. The experience with respect to this action line so far is mixed. Some countries, such as Germany, Belgium, France and Spain have relatively long traditions in the provision of such support, although there are variations in the type and range. Others, for example, Denmark, Ireland, Portugal, Finland and the UK, have introduced regional support mechanisms more recently.

In the Candidate Countries, experience with this type of measure generally centres on the creation of regional science/technology parks and business incubation centres.

Action 3.3: Training in entrepreneurship and innovation management

This action is primarily concerned with the setting up of education and training schemes in entrepreneurship and innovation management, where none exist, in higher education establishments and business schools, and with the dissemination of good practice in this area. The results appear to indicate that these schemes have been introduced by a large number of countries, although in a variety of different formats to suit different national circumstances, demands and contexts. Some of these schemes have been introduced or promoted by national governments, whilst others are being operated at the regional or even local level. Several instances were also provided of training schemes, programmes and courses introduced by individual institutions. At this level, the precise role of the national government is hard to discern, although countries in which this activity is an explicit policy goal include Denmark, Ireland, Germany, Italy, and the UK. The situation is comparable in the Candidate Countries.



3.5 Objective 4: Improving key interfaces

Action 4.1: Innovation at the regional level

This particular Action, which concerns the stimulation and coordination of regional initiatives and regional actors to devise and implement integrated research and innovation programmes at the regional level, also attracts considerable attention in both the Member States and Associate State countries and the Candidate Countries. As expected, countries with a high degree of regional autonomy (Germany, Belgium, Spain and also France) show high levels of development with regard regional innovation policy support and coordination. However, many countries have been involved in this type of activity for some time through exercises such as RIS and RITTS. Denmark, Portugal, the UK, Greece, Ireland, Sweden and Austria are all able to provide recent examples of regional innovation measures.

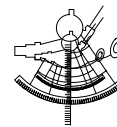
Among, the Candidate Countries, Poland, Bulgaria, Estonia and Hungary have provided examples of recent regional innovation support initiatives or policies.

Action 4.2: Lifelong learning

This analysis has focused on Government measures or policies aimed at facilitating the implementation of lifelong learning programmes to improve the general assimilation of new technologies and remedy shortages of skills (for example, 'Information Society' initiatives and more focused initiatives aimed at training/recruiting IT workers, or workers in other areas where there are perceived shortages of skills).

There is much evidence to suggest that lifelong learning is an important policy objective supported by the launch of specific strategies or action plans in many countries. Generally speaking, support for lifelong learning encompasses a wide range of measures. The examples of approaches to lifelong learning adopted tend to follow the broad categorisation set out below:

- Government strategies and plans:
 - Guidelines on lifelong learning within National Strategies (e.g. UK, Finland, Norway, Portugal, Latvia, Lithuania, Hungary);
 - Specific Action Plans on life long learning (e.g. Belgium (Flanders), Denmark, Germany, Luxembourg, Spain, Estonia, Slovakia).
- Investigations into lifelong learning:
 - Studies/reports/research programmes (e.g. UK, Spain, Belgium, Ireland, Finland, Greece, Portugal, Poland);
 - Seminars, debates and consultation forums (e.g. France, Germany, Estonia).
- Lifelong learning support:
 - Institutional measures (e.g. Portugal);
 - Institutional initiatives/agreements (e.g. Portugal, Spain);
 - Participation in Community initiatives (probably all).
- Awareness raising
 - Web-based initiatives (e.g. Austria, Bulgaria);
 - Other awareness raising (e.g. Netherlands, UK, Cyprus, Latvia).
- Training initiatives:
 - Education-based initiatives (e.g. Austria, Denmark, Germany, Netherlands, Spain, UK);
 - Training in ICT (e.g. Greece, Netherlands, Sweden, UK);
 - Vocational training (e.g. Luxembourg, Lithuania);
 - Technical training to executives and engineers (e.g. Cyprus);
 - Civil Servants training (e.g. Norway, Italy, Cyprus);



- General Training (e.g. Cyprus);
- Adult Training (e.g. Finland, Netherlands).
- Incentive schemes:
 - Self-employment schemes (e.g. Cyprus);
 - Tax facilities (e.g. Netherlands, Spain, Sweden, Poland).

Action 4.3: New missions for universities

This particular objective covers Government policies designed to encourage universities to give particular attention to the promotion of the diffusion of knowledge and technologies in addition to their traditional 'missions' of education and research. Considerable activity is reported under this action, particularly through policies designed to stimulate spin-off activities from higher education institutions. Indeed the number of spin-off companies created by HEIs is, in some countries, being increasingly adopted as a proxy performance indicator.

In the examples provided, two levels of policy intervention may be identified:

- a 'generic' recognition of the need for universities to adopt a more interactive role with the business community and society, either at the national or regional level, accompanied in some cases by modifications to the legal framework governing the operation of universities (e.g. Denmark, France, Germany, Italy, Sweden, Austria), particularly those which have a relatively low degree of autonomy from the state;
- the implementation of more specific measures designed to encourage and stimulate university-industry co-operation (e.g. Portugal, Belgium, Greece, UK).

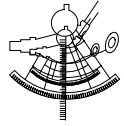
In some countries both types of policy have been introduced.

Conversely, little activity with regard to 'new missions' for universities is reported in the Candidate Countries, other than a number of specific measures designed to support co-operation with industry (e.g. Hungary, Romania)

Action 4.4: Technology transfer by large public research facilities

This action concerns the encouragement of large public research facilities to benchmark their activities in technology transfer and partnerships with enterprises. Overall, little progress towards this objective has been reported, and most of the reported examples of benchmarking concern the use of evaluations, either by an independent agency or on a self-assessment basis. Such evaluations may be conducted on a formal basis (i.e. required by legal frameworks) or on a more informal basis, for example, as part of an innovation survey. It should be noted that many of these evaluative arrangements do not explicitly cover technology transfer arrangements.

Formal arrangements for the evaluation of public research institutes are in place in the UK, Finland, Germany, Portugal and Belgium (Flanders). More informal arrangements (including a general government encouragement to benchmark) operate in France and Norway, to some extent. Few arrangements to benchmark the technology transfer activities of large public research facilities are in place in the Candidate Countries.



3.6 Objective 5: A society open to innovation

Action 5.1: Stakeholder debates on innovation

Most countries appear to have some type of initiative aimed at the promotion of stakeholder discussion or at the broader objective of raising public awareness of innovation. No overall trends or patterns can be detected other than the fact that some Governments expressly promote debate on innovation issues whilst others are less active. Several governments also sponsor or organise so called 'Science Years' or 'Science Weeks', although these are less concerned with innovation, *per se*.

Examples of Member State Governments active in this particular area include Austria, France, Portugal, Germany, Luxembourg, Sweden, Belgium, Spain, the UK, Finland and Norway. Among the Candidate Countries, activity is reported for Slovenia, Estonia, Cyprus, and Hungary.

Action 5.2: Public administration purchasing policies

Public administration procurement is taken to refer to the purchasing of goods and services, of a high technology or knowledge-intensive nature, in order to stimulate innovation in the domestic providers of those goods and services. However, there is some debate over the usefulness of state procurement as a means of fostering innovation.

Nevertheless, several countries offer the general examples of aerospace and defence as areas where government intervention may influence the performance of industry sectors.

Overall, three types of public procurement policy have emerged from the data provided:

- those dealing with R&D in specific sectors – other than aerospace and defence (e.g. Belgium, Denmark, Finland, Italy and Sweden);
- those dealing with SMEs (e.g. UK and Norway);
- those under the general heading of the Information Society and the use of electronic services (e.g. Denmark, Luxembourg, Austria, Portugal, Spain, and Romania).

Finally, some countries do not actively pursue such policies – for example, there is reluctance among policy makers in Ireland to consider policies of this kind as they are perceived to be potentially contrary to EU public procurement regulations.