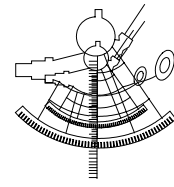


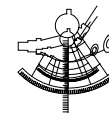
European Trend Chart on Innovation



Thematic Report

'Organisational and Entrepreneurial Innovation'

Covering period: October 2002 – March 2003



Innovation is a priority of all Member States and of the European Commission. Throughout Europe, hundreds of policy measures and support schemes aimed 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 organisation 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 developing innovative businesses; the protection of intellectual property rights; and the transfer of technology between research and industry.

The Trend Chart serves the 'open policy coordination approach' laid down by the Lisbon Council in March 2000. It supports organisation and scheme managers in Europe with summarised and concise 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 website (www.cordis.lu/trendchart) will provide access to the following services and publications, as they become available:

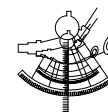
- a database of policy measures across Europe;
- a 'who is who?' of agencies and government departments involved in innovation;
- a series of six-monthly country reports for all countries covered;
- a series of six-monthly trend reports covered on each of the four main themes;
- a number of benchmarking 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 **Khaleel Malik and Marco Jaso, PREST, University of Manchester**. The information contained in this report has not been validated in detail by either the Member States or the European Commission.

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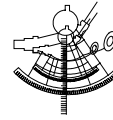
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Executive summary

This report sets out to identify general trends and issues arising within the activities of the EU Member States, Associated Countries and Accession Countries in the field of organisational and entrepreneurial innovation. The report is based on an analysis of the Trend Chart Country Reports of March 2003. These reports give a short overview of latest developments in the area of organisational and entrepreneurial innovation based on information gathered by the Trend Chart country correspondents.

Innovation policy has grown from our current perception of innovation and embodies the realisation that a fuller understanding of the concept of the knowledge-driven economy is still required and this requires us to think about the notion of organisational and entrepreneurial innovation in new ways. The new ways include thinking in terms of the changing nature of innovation processes and innovation policy, as well as about the reform processes that are underway in policy areas. This also means that there is a growing need to place innovation at the heart of other policy areas like employment, trade, competition, fiscal policy, regional policy, etc. in order to raise more awareness of innovation and to generally stimulate an entrepreneurial culture more widely.

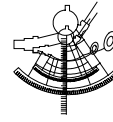
It is now acknowledged that there is an increasing range of topics that are generally perceived to be included under innovation policy in most countries. The most commonly cited topics included under innovation policy, as mentioned by the Trend Chart country correspondents, include: education/training, entrepreneurship stimulation, R&D policy, employment, regulatory issues and more. Also, in most countries, innovation policy is formulated and implemented by more than one single agency, ministry or department. The majority of country reports show that policies are coordinated through some form of inter-ministerial dialogue or similar process. A key actor for implementing inter-ministerial dialogue around innovation policies is usually a 'council' or other type of coordinating body.

Innovation has risen in prominence as policy-making processes evolve at the same time as a result of governance and regulatory reform issues and other influences such as increased interest in benchmarking and comparative or trend analysis, which impact on 'learning and dialogue'. A central concern around the issue of learning and dialogue is whether the results of any evaluations are actually fed back into policy making, and disseminated to a wider audience. In the EU Member States and Associated Countries there are some examples of evaluations conducted, but usually on an ad hoc basis or to varying degrees depending on the individual situation of the country. Examples of evaluations being linked to learning and dialogue are noted in most EU member and associate countries including Austria, Belgium, Finland, the Netherlands, Germany, Norway, Spain, Sweden and the UK. For most accession countries, the importance of carrying out evaluations of policy measures is stressed in some documents, so this may be taken more into account in the future.

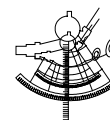
An important development in the area of innovation policy is whether reforms or regulations (e.g. employment conditions, planning processes) or other framework conditions (IPR regimes, taxation regimes, etc.) can have a positive impact on innovation policy. It appears that some framework conditions, such as the encouragement of public research organisations and higher education institutions to engage in IPR activity, are quite commonly implemented, especially across most EU Member States, with a number of countries adopting specific policies and measures in the area of IPR. Also, developments in the area of taxation reform show that many countries are engaged in discussions on whether to introduce 'tax credits' for R&D or similar support mechanisms, whilst those countries that have already employed R&D tax credit schemes continue to assess and refine them.

There are a number of initiatives that seek to promote entrepreneurship at a national level and this is well demonstrated by recent developments in the EU Member States and Associated Countries. While the spirit of entrepreneurship is still not as strong in a number of the Accession Countries, although there are some new initiatives that might help to improve this situation soon. Enterprise is at the heart of successful innovation. Entrepreneurial attitudes - even if not precisely identical motivations - underpin much innovation in public sector organisations. Support for such enterprising attitudes in general should be fostered. This is liable to require new approaches in the educational and vocational training systems, and methods that link innovation management with entrepreneurship

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are appropriate. If SMEs are to continue to remain an important focus of innovative effort, and of policy interest, then one aspect to highlight here is SME links with universities and other training institutions, which are being addressed in a number of countries.



'Organisational and Entrepreneurial Innovation'

1. Introduction

This theme deals with issues related to the concept of third-generation innovation policy. The concept and understanding of the innovation process have evolved since the development of the linear model process which views innovation as proceeding from ideas conceived in the laboratory through to commercial products in the market place. It is on this concept that first-generation innovation policies are based. We are now in the age of second-generation innovation policies, which understand innovation as a more complex, feedback-dependent process, heavily influenced by the existence of 'innovation systems'. Policy here deals primarily with the nodes and interfaces of these systems.

Third-generation innovation policy has grown from our current perception and embodies the realisation that a fuller understanding of the concept of the knowledge-driven economy is still required. This entails the fusion of two sorts of knowledge. The first concerns knowledge about the changing nature of innovation processes and innovation policy, while the second relates to knowledge about the rationale and reform processes underway in the specific policy areas. Key elements of this fusion centre on acceptance of a broader view of both the application of innovation and of the factors that influence it, and on the need to improve dialogue and mutual learning between policymakers in a wider range of policy areas. Thus third-generation innovation policy would place innovation at the heart of each policy area. For more detailed discussion of this subject area see the European Commission's recently launched report entitled 'Innovation Tomorrow'.¹

This report concentrates on the theme of innovation being pervasive, and how it influences and can be influenced by many factors. Therefore it is unrealistic to assume that a simple explicit focus on innovation will sufficiently address and stimulate (or control) all the opportunities for innovation that might be warranted in a complex dynamic economy. To elaborate this concept a little further, the links between innovation and other policy areas will be an integral feature of third-generation innovation policy in the future.

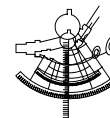
'Many policy areas are both vital inputs to innovation and themselves heavily shaped by innovation processes. 'Regional policy' is an evident case: innovation may be, and increasingly is, at the forefront of such policy. But the prospects for regions and thus regional policy are heavily shaped by innovations, especially those in the most dynamic regions. Much the same could be said about 'employment': a source of human capital for innovation, but where labour market policy also has to confront questions of uneven job loss and creation across sectors, areas, and skill levels. Or, to take another example, 'trade' is a stimulus to innovation, and is prompted by innovation. 'Environmental' concerns are very much a result of our use of technology, but increasingly shape directions of innovation. Education is of course central to the knowledge-based economy. Along with research policy, education policy helps underpin the frontiers of technological innovation. Supply of appropriate skills and talent can boost industrial innovation and competitiveness, both in high-tech sectors and in the economy more generally where there is a need to choose and utilize innovations initially produced elsewhere' (Malik et al., 2003)².

At present, research into the types and nature of policies which would fulfil the criteria of third-generation innovation policies is still sparse and in its formative stages. Obviously it is not possible to

¹ *Innovation Tomorrow - Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda*, 2002, References: EUR 17052, Catalogue Number: NB-NA-17037-EN-C, ISBN 92-894-4549-1:

See http://www.cordis.lu/innovation-policy/studies/gen_study7.htm

² Malik, K., Glynn, S., Butler, J. and Miles, I. (2003), 'Developing innovation policies for the knowledge economy in Europe', Paper presented at the *ASEAT 2003/Manchester Institute of Innovation Research 2003 Conference*, 7-9 April 2003, Manchester: 'Knowledge and Economic & Social Change: New Challenges to Innovation Studies'.



make detailed enquiries into national policies which address a type of policy of which there is yet little awareness. However, some current approaches to policy reform appear to be leading towards the prerequisites for the development of third-generation innovation policy. These largely focus on regulatory and institutional reform and reform of governance. The raising of awareness of a culture of entrepreneurship is also relevant, as is policy learning and coordination.

One of the European Commission's Objective 1 Actions for Member States, mentioned in the 'Innovation in a knowledge-driven economy' September 2000 communication³, is to 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. According to some commentators, one of the main challenges for European innovation policy coordination has been the inherently 'cross-departmental' nature of innovation policy formulation in the Member States. In many countries, the position of innovation at the interface between the spheres of 'science and education' and 'industry' motivates governments to possibly experiment with an 'administrative home' for innovation policy.

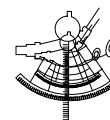
There are some interesting recent experiences that illustrate this type of policy coordination challenge in Europe. For example, in the UK, the situation is relatively straightforward, with the Department of Trade and Industry taking the lead role in delivering national innovation policy and in ensuring cross-departmental cohesion. In Austria, responsibility for technology policy remains fragmented across a number of ministries despite the creation of an innovation ministry. In Germany, the two federal ministries concerned with innovation have recently begun to prepare key policy papers jointly, and to promote their various innovation support measures through common brochures. Also there is usually a division of labour between the Germany's federal government and the *Länder* in most policy areas, including innovation policy. In the Netherlands, the issue has been tackled by a White Paper developed jointly by several ministries. The creation of a ministry dealing with science, technology and innovation in Denmark is a recent initiative.

'Innovation Council' structures can offer a different approach to solving the administrative home problem. Finland's Science and Technology Policy Council is often considered as a model here. The Council is responsible for the strategic development and coordination of Finnish science and technology policy as well as of the national innovation system as a whole. It is chaired by the prime minister and consists of seven other ministries and ten members representing innovation stakeholders. Portugal is one of the countries that recently adopted a similar model. With the launch of PROINOV as a coordination structure at the highest political level, innovation policy is now under the direct responsibility of the prime minister (EC Innovation Papers No. 29).⁴

A number of questions in the Trend Chart March 2003 Country Reports (for this theme: Organisational innovation and entrepreneurial innovation) attempted to obtain a picture of the current European situation with regard to innovation policy reform (and, ultimately, to the development of third-generation innovation policies). This report presents some of the key highlights from the Trend Chart country reports under the following themes: coordination of innovation and other policies (Section 2); learning and dialogue (Section 3); framework conditions (Section 4); and entrepreneurial culture (Section 5).

³ European Commission Enterprise DG (2000), 'Innovation in a knowledge-based economy', *Innovation and Technology Transfer* (Special Edition), November 2000.

⁴ EC Innovation Paper No. 29 (2002), *Innovation Policy in Europe 2002*, ISBN 92-894-4494-0, Office for Official Publications of the European Communities: Luxembourg.



2. Coordination of innovation and other policies

2.1 What does 'innovation policy cover?'

There is an extensive range of topics listed in the Trend Chart country reports under this theme, which demonstrates that innovation policy is now recognised as going beyond traditional science and R&D. In order to check which topics are amongst the most commonly cited across Europe, an analysis of the topics presented by the Trend Chart country correspondents was undertaken. **Table 1** lists all topics mentioned in the EU Member States and Associated Countries (referred to **EU 15+** in this report) country reports and **Table 2** lists all topics mentioned in the Accession Countries' reports.

Table 1 - Proportion of countries (**EU 15+**) where the following topics have been mentioned to be included under innovation policy by the Trend Chart country correspondents.

TOPIC	% Of countries mentioning this topic
Education/ Training (including Lifelong Learning)	76%
Entrepreneurship stimulation	45%
R&D policy	41%
Employment	41%
Science & Technology policy	35%
Competition	23%
Labour mobility	23%
Innovation financing	23%
Industrial policy (including trade)	18%
Planning and public administration	18%
Information society	18%
Organisational innovation	12%
Promotion of clustering	12%
Fiscal policies	12%
Regulatory issues	12%
Creation of new firms	12%
Regional policies	12%
Commercialisation of R&D	12%
Service innovation	12%
IPR	12%
Support for SMEs	12%
New forms of work	6%

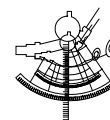


Table 2 - Proportion of countries (**Accession Countries**) where the following topics have been included under innovation policy by the Trend Chart country correspondents.

TOPIC	% Of countries mentioning this topic
Entrepreneurship stimulation	60%
Education/ Training	50%
R&D policy	50%
Employment	50%
Regulatory issues	50%
Support for SMEs	50%
Competition	30%
Innovation financing	20%
Regional policies	20%
Industrial policy	10%
Information society	10%
Promotion of clustering	10%
Creation of new firms	10%
Foresight	10%

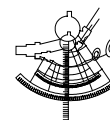
As illustrated in the above two tables there is a long list of topics and some of these might be generally perceived to be included under innovation policy and demonstrate how far innovation policy goes beyond traditional science and R&D policy. Here is a brief comment on three of the most highly cited topics to show why these topics might be considered to be either explicitly included under innovation policy or very closely related to innovation policy in most countries.

Education / training

These tables to some extent probably reflect recent policy initiatives targeting the reform of higher and further education systems in many countries, a trend that can be witnessed in both the Accession Countries and in several EU Member States. Some of these reforms (and more specific measures) have aimed at improving opportunities for interaction between the education system and other actors in the national system of innovation, while others have attempted to modernise or deregulate the education systems. Also, a heightened priority has been attached to 'lifelong learning' in policy initiatives, especially in the EU Member States. The current importance attached to training and lifelong learning is perhaps not that surprising given that we are faced with constantly changing technological (and, consequently, societal) demands. Therefore increasing numbers of adults will have to renew their knowledge and skills. Thus, while it is able to provide a foundation, initial education will no longer be able to offer the entire range of necessary skills.

Entrepreneurship stimulation

This topic is central to any innovation policy and it is mentioned in most of the country reports, as there appears to be a growing trend, at national level, to stimulate an entrepreneurial culture. This is closely linked to the topic of 'education/ training' since a number of efforts in this area take the form of training in entrepreneurial skills and dissemination of management best practice. Entrepreneurship stimulation includes actions that aim to promote the dissemination of knowledge between research institutions, universities and companies. 'This may involve the development of closer links between research and training (i.e. anticipating the needs of the productive sector); facilitating university company start-ups, legal and contractual arrangements between universities and public research organisations for the exploitation of results with industry; demonstrator projects; co-financing schemes and awards for academic/industrial research co-operation; stimulation of dialogue between the producers and users of technology (such as sectoral and inter-sectoral forums, technology clubs, etc.); creation and growth of science and technology parks, etc.' (Trend Chart Synthesis Report 2002).



Employment

This topic is mentioned in most of the country reports and here it includes 'labour markets', but not 'labour mobility', which is shown as a separate topic since it deals more with workforce mobility than with creation of new employment opportunities through innovation. Full employment and decent employment is a policy goal for the EU. Technological change and organisational innovation impact upon the number, nature and location of jobs. It should be noted here that skills, and broader capabilities to manage and master change, are liable to shape, facilitate or even impede innovation.

2.2 Formulation and implementation of innovation policy

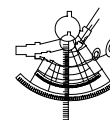
2.2.1 Developments in EU 15+ States

In most countries in this group, innovation policy is formulated and implemented by more than one single agency, ministry or department. In most European countries the structure of the National System of Innovation is the result of a historical process, whereby the responsibilities for innovation and technology policy mainly follow the traditional division of labour between the ministries and agencies rather than the requirements of an integrated policy approach.

At central government level there is usually more than one ministry or department that formulates innovation policies. For example, in **Austria** there are four main players that formulate innovation policy: the Ministry of Transport, Innovation & Technology, the Ministry of Economic Affairs and Labour, the Ministry of Education, Science & Culture and the Ministry of Finance. Also, the Council for Research and Technology Development serves as a think tank to all ministries affiliated with innovation policy. It regularly formulates non-binding recommendations to the government. These recommendations cover a number of aspects like the international mobility of researchers, promotion of start-ups and seed financing, funding of public universities and intellectual property rights issues, etc. Similarly, in **Italy** several ministries and regional departments formulate innovation policy and responsibility is scattered around different administrations. For instance, the Ministry of Productive activities is responsible for any IPR-related aspects and the Ministry of Labour is responsible for any employment-related innovation aspects. **Luxembourg** has two ministries currently in charge of the different domains relating to R&D and innovation. The Ministry of Economy is responsible for the promotion of companies' private research, innovation and technology transfer. The Ministry of Culture, Higher Education and Research is responsible for all research activities conducted in the public sector.

In **Denmark**, the establishment of the Ministry of Science, Technology and Innovation in 2002 improved the possibilities of coordinating innovation policies, due to the extension of the portfolio of the ministry to include a number of innovation-related policy formulation areas formerly placed under the Ministry of Commerce. In **Finland** the Science and Technology Policy Council formulate the general framework for national innovation policy in a triennially launched review. Different ministries and public agencies are responsible for the implementation of policy. In **Iceland**, the main responsibility for innovation policy formulation lies with the Ministry of Industry and Commerce, but any policy initiatives are jointly generated by various organisations, from the public and private sectors.

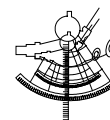
Ireland's Office of Science and Technology (OST) within the Department of Enterprise, Trade and Employment holds the central role for policy formulation and development in relation to science, technology and innovation (STI) issues. The 1996 White Paper on Science, Technology and Innovation confirmed the OST's role of coordination of STI policies across all government departments. This role crosses departmental boundaries and requires a degree of coherence and consistency of approach both from a national development perspective as well as from the perspective of efficient and effective use of public finances. In **Norway**, the Ministry for Education & Research, the Ministry of Trade & Industry and the Ministry for Local Government & Regional Affairs share the main responsibility for the development of national innovation policies. Norwegian R&D policy formulation is based on the so-called 'sector principle', meaning that each ministry is responsible for promoting and funding research activities within their own areas. Accordingly, the responsibility for innovation as well as R&D matters is divided between several ministries. Most ministries allot funds for R&D and the major players in addition to the two above-mentioned ministries



are: the Ministry of Health, the Ministry of Social Affairs, the Ministry of the Environment; the Ministry of Defence, Ministry of Fisheries; and the Ministry of Agriculture. At governmental level there are two high-level committees focusing on science and technology policy-related issues: the inter-ministerial Research Forum for Government Officials (Departementenes forskningsutvalg – DFU), and the Government’s Research Board (Regjeringens forskningsutvalg – RFU). The formulation of innovation policy in **Spain** is developed through the participation of several ministries, but there is an inter-ministerial body in charge of planning, coordination and monitoring of the R&D National Plan, the Inter-ministerial Commission for Science and Technology (CICYT). Apart from the Ministry of Science and Technology, established in 2000, there are other ministries with specific innovation policy responsibilities for some programmes and measures in their fields. This includes the Ministry of Economy, Ministry of Education and the Ministry of Health.

In the **Netherlands**, the Ministry of Economic Affairs takes a leading role on innovation policy matters, as this policy is developed internally and mainly organised around the annual budget cycle. Other ministries take lead roles in some innovation policy-related programmes. For example, the Ministry of Education, Culture & Science takes the lead in all matters relating to research and education interactions. In the area of lifelong learning this ministry coordinates its efforts with the Ministry of Social Affairs and Employment. The **UK’s** Department of Trade and Industry (DTI) is primarily responsible for innovation policy and has an overall coordinating role, although all ministries will address competitiveness and innovation issues where they impinge upon their departmental responsibilities. However, as the UK government firmly believes that innovation is a complex policy area transcending strict departmental responsibilities, other departments with relevant interests will also participate, and even take a leading role, in the formulation and development of innovation policies. For example, in areas concerning science and technology issues, the Office of Science and Technology will be involved (although, structurally, this lies within the DTI), while the Department for Education and Skills will cover education and employment issues. Similarly, in areas of fiscal policy, the Treasury may take a lead role. Some reviews relating to a specific policy area that might be an innovation policy will be undertaken by government departments or may be commissioned through external consultants, or professional bodies. A commonly preferred option is to convene a special working group, generally chaired by a leading figure from academia or industry. Once a policy has been developed, it is published as a government strategy document (sometimes in the form of a White Paper). Implementation of the specific measures contained therein then falls to the relevant government departments and agencies, with funding released through a Treasury-approved spending review.

For **Portugal**, the key players in formulation and implementation of innovation policy are the Ministry of Economy and the Ministry of Science & Higher Education and their agencies. For **Germany**, given the federal character of the German state, there is a division of labour between the federal government and the 16 *Länder* (federal states) governments in financing education, R&D and innovation policy programmes and launching innovation policy initiatives. The federal government’s role in research and innovation is manifold. First, it takes care of innovation-friendly framework conditions in legislation, macroeconomic stability and competition. Second, it follows a strategic view on R&D, attempting to direct both public and private R&D activities towards certain fields of technology. The *Länder* governments are principally engaged in financing the education system and basic research at higher education institutions (HEIs), mainly through general university funds. The main actors in innovation policy among the federal ministries are the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Economics and Labour (BMWA), but several other federal ministries are engaged to some extent in innovation policy too, e.g. through technology programmes or financing of military-oriented R&D. The federal government is responsible for sector-specific policies, which often have considerable technology policy impacts (e.g. in the areas of energy, transport, environment, health and for setting the overall legal framework in the fields of competition policy, taxation, market liberalisation, employment law etc.). Responsibility for these sector policies is split among several federal ministries. In **France**, the budget allocation to support research and innovation in the private sector is managed in a ‘fragmented’ way by ANVAR, and the ministries for Research, Industry and Transport (except Defence). They are managed at the same time on the local level (DRIRE, DRRT, regional delegations of ANVAR) and at the central level by the directions of the ministries. It is reported in the French Trend Chart Country Report (March 2003) that this multiplication of financing circuits is often perceived as a source of confusion and opacity by the



companies who wish to have clear access, and if possible single access, to the financing sources of their R&D development. **Belgium** provides an example of a highly federalised state, where most areas of major importance for innovation policy - economic development policy, technology policy and industrial research policy - are under the control of the Regions, which have complete autonomy in these matters. At the regional level, an innovation agency exists in Flanders, while in Wallonia and Brussels the regional administration for research is currently responsible for managing aid schemes related to innovation matters.

2.2.2 Developments in Accession Countries

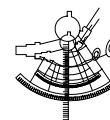
Again, as with the EU15+, in the case of most Accession Countries, innovation policy appears to be formulated and implemented by more than one single agency, ministry or department. However, for **Bulgaria**, according to the Trend Chart country correspondent, there does not appear to be an explicit innovation policy in place yet. But the Ministry of Economy and the Ministry of Education & Science are the executive organs, which deal with innovation issues on an ad hoc basis. However, their position paper 'Science, Technology and Innovation (STI) in Bulgaria: Strategy and Implementation' (launched in September 2002) foresaw the elaboration of an STI policy for Bulgaria and the creation of a national organisation to coordinate the adoption and execution of STI policy. This paper recommended the formation of a National Council for Science, Technology and innovation. Similarly in the **Czech Republic**, there has not been an explicit policy for innovation formulated to date.

Estonia's Research Development Council (RDC) is the main strategic body to the Estonian government on science and innovation related issues. The prime minister chairs this body *ex officio* and its daily work is split between two sub-commissions, headed by the Minister of Education & Research and the Minister of Economic Affairs & Communications. These specialise in science policy-related issues and applied research innovation-related issues respectively. The main organisation that implements Estonian innovation policies is Enterprise Estonia with its agencies. The Technology Agency ESTAG plays the main role in implementing innovation policy. Science grants are provided through the Estonian Science Foundation.

In **Hungary**, three ministries are mainly involved with the formulation and implementation of innovation policy. The Ministry of Education is responsible for designing and implementing the Hungarian science and technology policy, for competition-based research and development programmes and for the promotion of international science and technology co-operation agreements with Hungary, including EU-related research matters. The Ministry of Economy and Transport is responsible for the development of an entrepreneurial and co-operative culture within the SME sectors. The Ministry of Informatics & Communication has specific responsibility for the development of the information industry. Similarly in **Latvia**, mostly the Ministry of Economy and the Ministry of Education and Science share the responsibilities of administrating innovative developments on the governmental level. The Latvian Development Agency plays a part in implementing specific government policies. Technology parks and centres are also contributing to innovation policy development.

Innovation policy in **Poland** is formulated by a number of ministries. The most important are the Ministry of Economy, Labour & Social Policy, the Ministry of National Education, and the State Committee for Scientific Research. The financial aspects are in the hands of the Ministry of Finance. The Trend Chart country report (March 2003) indicates that one of the main problems in Poland is the lack of cohesion between various ministerial strategies and programmes on innovation-related matters. In **Romania**, the Ministry of Education and Research (MER) takes the lead in applying governmental policy in the field of research development and innovation. Other ministries involved in the application of the innovation policy together with MER include the Ministry of Industry & Resources, the Ministry of Agriculture, Food & Forests, the Ministry of Water & Environment Protection and the Ministry of Information Technology and Communications.

The **Lithuanian** Ministry of Economy has a leading role in the formulation and implementation of innovation policy in Lithuania. However, there is no one single actor with overall responsibility. Other actors that have an important input into innovation policy formulation are the Ministry of Science and Education and the Information Society Development Committee, a government agency, which leads



on innovation matters relating to information society developments. Also the Lithuanian Small and Middle Sized Business Development Agency plays an important role in the development of SME policies. Innovation policy in the **Slovak Republic** was formulated in the Sectoral Operational Programme: Industry and Services (SOPIS). In accordance with the resolution of the document Slovak Government No. 606/2002 on 'Securing the contextual and organisational elaboration of the National Development Plan of the Slovak Republic (NDP SR)', the Slovak Ministry of the Economy introduced the 'Sectoral Operational Programme: Industry and services' (SOPIS) for the period 2004–2006'. The objective of SOPIS is to preserve and further develop Slovakia's industrial potential, tourism and trade, and to contribute effectively to increasing the output and competitiveness of the economy, with the aim of achieving industrial output reaching 51-54% of the EU-15 average by 2006. Implementation of various measures and programmes in this area is shared by several ministries and agencies, whose responsibilities relate to different parts of the policy areas. In **Slovenia**, R&D aspects of innovation policy are usually extensively discussed within the National Science & Technology Council (NSTC). Representatives from the Ministry of Economy (especially with interests in technology transfer and competition areas) and the Ministry of Education, Science and Sport as well as representatives from the business sector, scientific community and the universities all sit in the NSTC. Then any innovation programme proposals are presented by the NSTC to the above-mentioned ministries before they are adopted by Parliament. Also, some activities and measures for entrepreneurship promotion in Slovenia are part of the Ministry of Economy, where each office prepares a four-year plan in accordance with the basic guidelines of the Strategy of Development and National Development Plan.

2.3 Policy development and coordination, and the role of innovation

2.3.1 General policy coordination

Most of the findings reported under this sub-section in the current Trend Chart Country Reports (March 2003) are very closely related to the developments described in the previous section. The majority of country reports show that policies are coordinated through some form of inter-ministerial dialogue or similar process. A key actor for implementing inter-ministerial dialogue around innovation policies is usually a 'council' or other type of coordinating body. As seen from **Tables 3 and 4** below, there appears to be an increasing trend in using some form of a coordinating body in both the EU15+ and Accession Country groups.

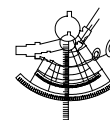
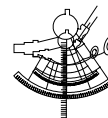


Table 3 – Government bodies central to coordination of innovation policy (EU 15+)

EU 15+ States	Name of 'council' or other type of coordinating body
Austria	Council for Research & Technology
Cyprus	The Planning Bureau (helps with coordination of innovation policies)
Denmark	Council for Technological Innovation
Finland	Science & Technology Policy Council
France	(through inter-ministerial dialogue)
Germany	(through joint commissions and informal co-operations)
Greece	Competitiveness Council
Ireland	Irish Council for Science, Technology & Innovation
Israel	(through inter-ministerial dialogue)
Italy	Inter-ministerial Committee for Economic Planning
Luxembourg	(through inter-ministerial dialogue)
Norway	Inter-ministerial Research Forum for Government Officials and the Government Research Board
Netherlands	(via three inter-departmental committees)
Portugal	Inter-ministerial Commission on Innovation & Knowledge
Spain	Inter-ministerial Commission for Science & Technology
UK	(through network of inter-departmental committees)
Belgium	-
Iceland	-
Sweden	-

Table 4 – Government bodies central to coordination of innovation policy (Accession Countries)

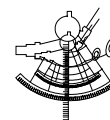
Accession Countries	Name of 'council' or other type of coordinating body
Bulgaria	National Council for Science, Technology & Innovation
Estonia	Science Competence Council
Hungary	(through inter-ministerial dialogue)
Poland	Committee for Scientific Research
Romania	Inter-ministerial Council for Science, Technology & Innovation
Slovenia	National Science & Technology Council
Czech Republic	-
Latvia	-
Lithuania	-
Slovak Republic	-



2.3.2 Innovation a key criterion for development of policies across the board

One of the other 'coordination of innovation' issues addressed in the last round of Trend Chart country reports (March 2003) was whether there are any efforts to make innovation a key criterion for development and assessment of policies (and policy reform and governance processes). Here the majority of country reports, from both the EU15+ group and Accession Countries group, either stated that there is no evidence (reports or communications etc.) to address this issue or it had not been possible for the country correspondents to find any concrete examples or indications of such efforts. Here is a selection of comments from the few country reports that found some evidence that addressed this issue.

Innovation and employment have been the two main topics of debate in the current **German** federal government, as these concepts are still at the heart of overall policy goals, although a shift towards employment has been noted during the last year. However, there is no formal mechanism to assess other policy areas and their impacts on innovation policy. The **Portugal** country report confirms that one of the tasks of the Inter-Ministerial Commission on Innovation and Knowledge is to discuss, approve and revise the responsibilities of the different ministries in the innovation field. Nothing is said about making innovation a key criterion for the development and assessment of policies. This requires, as indicated in the Portugal report, a deeper understanding of the transversal nature of innovation. In the **UK** there are some efforts in areas of strategic relevance, such as education and training, planning or labour market policy. How far this extends into all policy areas is hard to determine. In **Bulgaria** there appears to be some effort to make innovation a key criterion for development of broader policies, as one of the Bulgarian national priorities is compliance of the national innovation system with EU integration requirements. This is also a national priority in a few other accession countries, including **Romania**, for example. In **Estonia** there are several strategies and programmes worked out in different ministries, but the problem is that very often these are separate documents and are not very well integrated to foster the competitiveness of Estonian enterprises and economic development as a whole. Therefore lately more attention has been paid to the integration of different policy documents and programmes. According to various government publications, **Latvia** views innovation and especially activities leading towards the development of IT and a knowledge-based economy, as an integral part of the criteria upon which economic growth will be assessed in the future. An interesting development to note in **Slovenia** is that at the same time that some innovation measures are implicitly promoting employment growth, the employment strategy itself does not stress innovation as one of its main policy thrusts.



3. Learning and dialogue

This section of the report presents some trends with respect to 'learning and dialogue'. In other words, how is the effectiveness and impact on innovation of policy formulation and implementation measured, if at all? Are there regular evaluations or broader strategic reviews, or is the process more ad hoc? With innovation at the fore in the knowledge-based economy, it is no surprise that innovation policy has risen in prominence. Here it is worth noting that many countries now use the process of evaluation to judge whether government interventions in their national systems of innovation have been useful, effective and performed efficiently. For example, in countries such as Canada and the United States, evaluation forms a key element in results-based management systems. Evaluation also forms an important learning device in the design of policy programmes in the United Kingdom, Norway and Finland, and recently the Dutch government developed a transparent and results-based budgeting and management system. Other European countries with extensive track records in the evaluation of policy instruments, albeit with differing perspectives and experiences, include Germany, France and Sweden⁵.

3.1 Learning in the knowledge-based economy

In a knowledge-based economy, domestic institutions support knowledge development and acquisition. A broad range of institutional factors affects an economy's capacity to take advantage of a new technology, although their influence has generally been more difficult to isolate quantitatively (see, for example, Levine and Renelt, 1992)⁶. Some of these factors might include a stable political environment, high quality management training, a strong base of civic institutions and well-developed economic adjustment mechanisms. In many European Member State countries attention is already devoted to encouraging investment, and strengthening institutional factors, such as the efficiency of capital markets and the state of a country's physical infrastructure, that may affect the investment process. There is recognition that where inadequacies in infrastructure or the structure of capital markets constrain or distort investment, technological change could in turn be significantly impaired (Gera et al., 2001)⁷. Knowledge-based economies must invest in retraining and in facilitating the movement towards lifelong learning (Betcherman et al., 1998)⁸. Knowledge-based economies devote considerable effort to developing those intangible aspects of infrastructure that influence an economy's capacity to both develop and use new knowledge. The workforce is highly educated and well trained, and programmes are available to encourage and facilitate lifelong learning.

Innovation has risen in prominence as policy-making processes evolve at the same time as a result of governance and regulatory reform issues and other influences such as increased interest in benchmarking and comparative or trend analysis, which impacts on 'learning and dialogue'. This aspect is particularly well illustrated by the European Innovation Scoreboard⁹ and the Trend Chart

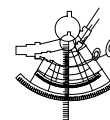
⁵ Cunningham, P.N., Boden, M., Glynn, S. and Hills, P. *Measuring and Ensuring Excellence in Government Science and Technology: International Practices – France, Germany, Sweden and the United Kingdom*. Report for the S&T Strategy Directorate, Industry Canada, in support of the Council of Science and Technology Advisors (CSTA), March 2001.

⁶ Levine, R. and Renelt, D. (1992), 'A sensitivity analysis of cross-country growth regressions', *American Economic Review*, 82.

⁷ Gera, S., Lee-Sing, C. and Newton, K. (2001), 'The emerging global knowledge-based economy: Trends and forces', in L. Lefebvre, E. Lefebvre and P. Mohnen (eds.), *Doing Business in the Knowledge-Based Economy: Facts and Policy Challenges*, Kluwer Academic Publishers: Dordrecht, pp. 1-48.

⁸ Betcherman, G., McMullen, K. and Davidman, K. (1998), *Training for the New Economy – A Synthesis Report*, CERN: Ottawa, *op cit.* L. Lefebvre, E. Lefebvre and P. Mohnen (eds.), *Doing Business in the Knowledge-Based Economy: Facts and Policy Challenges*, Kluwer Academic Publishers: Dordrecht, pp. 1-48.

⁹ EC Enterprise DG (2001) *Building an innovative economy in Europe*, Office for Official Publications of the European Communities: Luxembourg.



project, which provides numerous reports at its website¹⁰. Such activities allow examination of the innovation performance of Member States, and of the infrastructures, capabilities, processes and strategies with which states attempt to enhance it. Accordingly, as the European economy becomes increasingly knowledge-based, and innovation practices are transformed, new approaches to innovation policy need to be considered. Therefore in formulating new innovation policy approaches it would be useful to establish, at national level, whether innovation and innovation policy experts or officials are actually involved in the formulation of new approaches. Also a central concern around the issue of learning and dialogue is whether the results of any evaluations are actually fed back into policy making, and fed back to a wider audience.

3.2 Developments in the area of 'learning and dialogue'

Owing to the variable quality of information provided, it is difficult to present a comprehensive picture of the situation across Europe. From the available information it seems that overall, policy efforts tend to be relatively varied on this particular issue. Therefore a 'snapshot' of the current situation is given below.

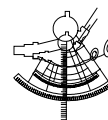
3.2.1 EU 15+ Countries

These are some examples of evaluations conducted, usually on an ad hoc basis in a number of the EU 15+ countries:

- Austria (the Austrian Research and Technology Report is published yearly and the results are available to the general public);
- Belgium (the Flanders region conducts periodic evaluations of programmes and funding for major research institutions);
- Finland (evaluation is common practice in the management of publicly funded research programs where external experts are usually invited to secure impartial and objective findings);
- The Netherlands (increasing use of base-line studies, annual monitoring and *ex post* evaluations at the individual instrument level, with evaluations conducted by externally appointed consultants and results usually made public);
- Germany (a main development here is the carrying out of 'systemic evaluations' that cover a set of programmes and assess the relevance and success of policies or institutions in place rather than analysing the effectiveness of individual measures or individual research institutes or researchers);
- Luxembourg (created in 2002, the Innovation Observatory made a study of the strengths and weaknesses of innovation policy. The different ministries in charge of innovation policy are all members of this observatory, so they are made aware of the results from this study);
- Norway (there are evaluations of specific programmes and policy measures, though often at irregular intervals and major instruments and organizations are evaluated on an ad hoc basis);
- Spain (there is a yearly balance of activities and programmes launched and previous strategic goals might be revised accordingly);
- Sweden (process is ad hoc and differs from one policy measure to another);
- The UK (the use of assessment, monitoring, evaluation and related activities has been broadly accepted throughout government for several years and proposals for new innovation programmes costing over £1 million/ €1.64 million in the DTI must be accompanied by a ROAME¹¹ statement, which must be approved by the individual programme committee and the DTI minister);

¹⁰ European Trend Chart on Innovation website: www.cordis.lu/trendchart

¹¹ The ROAME statement specifies the Rationale, Objectives, Appraisal, Monitoring and Evaluation elements associated, in an iterative process, with the programme. Recently, the approach has been modified to ROAME-F. This highlights the importance of the Feedback process in disseminating the results of evaluations, and in incorporating the lessons learned at the early stages of other programmes (Source: UK Trend Chart Country Report (Covering Period: October 2002 – March 2003).

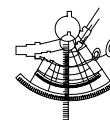


3.2.2 Accession Countries

It appears that the effectiveness and impact on innovation of policy formulation and implementation is not yet measured in most Accession Countries apart from a few. However the importance of carrying out evaluations of policy measures is stressed in some documents in the Accession Countries, so this may be taken more into account in the future. The few countries where some evaluations are undertaken are:

- Estonia (the first large evaluation of the Estonian innovation policy was undertaken by an external consultant from Finland in 1999, after which a Technology and Innovation Division was set up at the Ministry of Economy and some reforms were seen in the Estonian national system of governance for innovation policy from 2000 onwards);
- Slovenia (The Ministry of Education, Science and Sports, responsible for R&D financing along with the Ministry of the Economy, responsible for technology and innovation measures, are both conducting some *ex post* as well as *ex ante* policy reviews. For the long-standing measures, some *ex post* reviews are regularly conducted along with required reporting schemes on research projects and other financed activities. For recent measures, policy makers mostly rely on ad hoc reviews, but a standing scheme of evaluation is developing within the so called 'Targeted Research' programmes. Contracted innovation policy experts usually carry out policy reviews as well as assessment of measure's effectiveness. Most of the findings are then fed back into policy making).

As is the case with most of the accession countries, the Latvia Trend Chart country report (March 2003) confirms that innovation policy is a new and emerging concept in Latvia and only the very first steps have been taken towards developing a comprehensive system of innovation. The development plans envisage that reforms will have a positive impact. Only when programmes geared towards innovation have been implemented and evaluated inconsistencies and policy mismatches can be established. Currently, there is little or no information available on this topic area. The Poland country report makes the important observation that dialogue with a wider audience is lacking and this can be considered a weakness of current innovation policy. Therefore the public does not have any access to most of the reports that are published in the areas relating to innovation policy, as these are published as economic reports for 'internal use only'.



4. Framework conditions

This section of the report presents any insights gained by the Trend Chart country correspondents from the last round of country reports (March 2003) that deal with 'framework conditions'. Here the main issues being addressed are whether there had been any recent examples of reforms or regulations (e.g. employment conditions, planning processes) or other framework conditions (IPR regimes, taxation regimes etc.) that have had a positive impact on innovation policy (especially if intended).

4.1 Rationale for regulatory framework

The rationale for 'regulatory reform' is based on the assumption that regulations themselves are too numerous and too complicated, as are systems of monitoring compliance and assessing applicability. Regulatory reform has become something of a mantra across the industrialised world, and it is worth noting that the OECD makes the case that: 'regulatory reform enhances competition and reduces regulatory costs can boost efficiency, bring down prices, stimulate innovation, and help improve the ability of economies to adapt to change and remain competitive. Properly done, regulatory reform also can help governments promote other important policy goals, such as environmental quality, health and safety ...' (OECD, 1997)¹².

The need for a regulatory framework conducive to innovation is recognised by the European Commission in its communication 'Innovation in a knowledge-based economy' (2000)¹³. This communication identifies areas where regulatory reforms can strongly influence innovation: rules and statutes can impede the diffusion and exploitation of research results obtained with the support of public funding. An example concerns rules dealing with the terms of employment of researchers in public service that may inhibit commercialisation of the knowledge developed through their research; unnecessary regulation which slows down the introduction of new products onto the market needs to be streamlined or removed; traditional methods for reporting and documenting companies' intangible assets probably undervalue innovative efforts, and new European accounting standards should address this.

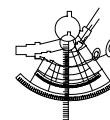
4.2 Developments in area of 'framework conditions' for innovation

The 'framework conditions' examples cited by most of the Trend Chart country correspondents (March 2003 country reports), as having some impact on innovation policy are mainly related to taxation regimes and IPR regimes. It appears that the encouragement of public research organisations and higher education institutions to engage in IPR activity is quite widespread, especially across most EU Member States, with a number of countries adopting specific policies and measures in the area of IPR. Also as confirmed in a previous Trend Chart Thematic Report on Innovation Financing (2002)¹⁴, there continues to be some indication that fiscal measures are increasing in popularity amongst governments as a means of promoting certain types of innovation behaviour. For example, many countries are engaged in discussions on whether to introduce 'tax credits' for R&D or similar support mechanisms, while those countries that have already employed R&D tax credit schemes continue to assess and refine them.

¹² OECD (1997), *The OECD Report on Regulatory Reform: Synthesis*, OECD: Paris.

¹³ European Commission Enterprise DG (2000), 'Innovation in a knowledge-based economy', *Innovation and Technology Transfer* (Special Edition), November 2000.

¹⁴ Trend Chart Thematic Report (2002), *Innovation Financing*, available at European Trend Chart on Innovation website: www.cordis.lu/trendchart



4.2.1 EU 15+ Countries

The new institution 'Wirtschaftsförderung Austria GmbH' was set up in **Austria** in September 2002 to simplify the institutional structures in funding, provide tighter coordination of innovation promotion activities with the objectives of the Austrian government, and to help reduce governance costs. The Austrian tax reform that came into effect in 2000 included enhanced indirect promotion measures. Enterprises can deduct 25% of their R&D spending from their profits thus reducing the basis for taxation. For all R&D spending that is above average spending during the past three years, 35% can be deducted from the tax base. This higher allowance is intended to increase incentives for additional R&D spending by firms with no R&D in the past. This reform of tax incentives for R&D improves the situation for firms but at the same time creates an increasingly complex set of instruments that in turn may increase administrative costs and information requirements for enterprises, according to the latest Austria Trend Chart country report (March 2003). In **Belgium** there is little evidence of changes being made in other policies, regulatory or legal framework conditions specifically with a view to improving innovation performance.

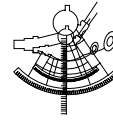
The most important structural reform in **Finland** concerned the piloting of the polytechnic system and its establishment on a permanent basis. Also, the Finland University IPR reform is now being introduced and will focus on the intellectual property rights and the 'third' task of universities. The reform is attempting to promote collaboration and the commercialisation of research. This new spate of reform is planned to be introduced to the government in autumn 2003. **Germany's** large tax reform (DE 14) that came into force in 2001 has reduced corporate taxes and thus raised company profits, which is regarded as one factor that affects the propensity to innovate. Another area of regulatory reform with likely positive effects on innovation is market liberalisation in telecommunication, energy markets, transport markets, and postal services (DE 61). In **Greece** employment regulations envisage higher flexibility, and a tax exemption for R&D was introduced in 2002, but there is no evidence of the impact of these regulations yet.

In **Iceland**, some major impacts on innovation have been achieved through a number of general economic policies, liberalisation of financial markets and privatisation of state companies during the late 1990s. Also a recent reduction of corporate tax from 30% to 18% is seen as an important innovation policy measure for Iceland.

In **Ireland** there are no instances of reforms to regulations or other framework conditions that have had a positive impact on innovation policy. The most recent policy developments in the area of innovation date from the 1996 White Paper on Science, Technology and Innovation and to a lesser extent the Foresight Initiative undertaken in 1999 by the Irish Council for Science, Technology and Innovation, which included a number of innovation policy-related recommendations. Forfás, the national policy and advisory board for enterprise, trade, science, technology and innovation, and IDA, the state agency responsible for inward investment, have submitted a paper to the Office of Science and Technology within the Department of Enterprise, Trade and Employment outlining the benefits of introducing a R&D tax credit into the Irish taxation system. **Israel's** innovation policy is influenced by framework conditions. For example, the Technological Incubators Program (IL 7) was stimulated by the massive immigration of technologically qualified people from the Soviet Union, but it is not much affected by general reforms to regulations. In **Italy**, some changes to patenting for industrial inventions introduced by the 'One Hundred Days Programme' is expected to have a positive impact on innovation policy.

In **Portugal**, there is some debate about the launching of fiscal incentives for investment in R&D (SIFIDE), which led companies to increase their commitment to R&D activities. But, according to the Trend Chart Portugal country report (March 2003), in the absence of a sound evaluation it is hard to know whether an increased declaration of R&D expenditures was just used as a device for legal tax evasion or really corresponded to an increased allocation of resources to R&D activities.

In **Spain**, the establishment of an appropriate framework to encourage innovation has been a growing concern during last few years and has been considered in the design of instruments for innovation policy. In this sense, fiscal measures have been modified in order to encourage R&D investments in private companies, mainly because the Fiscal Regulation introduces the Innovation definition of the



Oslo Manual and opens the fiscal incentives to other activities that are not traditional R&D. With these changes, fiscal incentives for innovation are a fundamental instrument to increase innovation investments in the private sector in all areas of the Spanish economy.

Although it is too early to fully assess its impact, the introduction of a small firms' R&D tax credit in the **UK** was viewed as a positive contribution to innovation and, following a consultation by the Treasury, was extended to encompass all sizes of companies. However, the broad nature of framework conditions combined with the complexity of innovation makes it difficult to identify a clear attribution between policies and their downstream effects.

4.2.2 Accession Countries

In September 1999 the **Bulgarian** Parliament passed a series of laws on trademarks and geographical indications, industrial designs and integrated circuits. In March 2000 amendments to the Law on Copyright and Neighbouring Rights extended copyright protection to 70 years.

Estonia has seen several reforms that have been introduced since 2000 leading to the implementation of today's innovation policy and which have proved very positive for the development of the Estonian innovation system. In autumn 2001, the Bank of Estonia, Chamber of Commerce and Industry as well as leading universities formed a special foundation 'Centre for Strategic Initiatives'. A major problem in Estonia continues to be a lack of qualified labour. The first steps to remedy this situation have been taken through educational reforms. Patenting activity is very low, since there are no special tax incentives for researcher mobility and for IPR. Another reason is the high costs associated with patenting, deterring patent-oriented research.

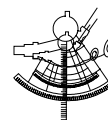
According to the representatives of the Ministry of Education the new Innovation Law of **Hungary** will build a stable legal and calculable financial environment. In 2002 and 2003 there was a significant (10-50%) increase of salaries for all public servants. The salary increase also included researchers and scientists at higher educational R&D institutions. Moreover, scholarship funds for PhD students have also been raised. However, it is too early to determine the contribution of raising salaries and scholarships and the overall improvement of the Hungarian R&D culture such as mobility of young researchers etc.

Evaluation reforms of framework conditions impacting innovation policy have not taken place in **Latvia** at this time. Innovation policy is a new and emerging concept here and only the very first steps have been taken towards developing a comprehensive system of innovation. The development plans envisage that reforms will have a positive impact. Only when programmes geared towards innovation have been implemented and evaluated can inconsistencies and policy mismatches be established. Similarly there is no evidence of such regulations in **Poland**. Many regional development strategies have an insufficient emphasis on innovation, due to the lack of funding and capacity to define innovation strategies in some offices (i.e. autonomous government on the province level). Additionally, policy makers have not yet realised the value of an efficient patent system to foster innovation development. These affect the content of regional innovation strategies.

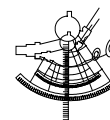
The **Romanian** government adopted the Action Plan to improve the business environment for SMEs in May 2001, and progress will be reviewed every six months. This Action Plan is part of the government's overall working programme for 2001-2004. The main priorities in the short term are to improve the legal framework for SMEs and eliminate administrative barriers. The offer of services for SMEs has increased, including services like networks, databases, training programmes, etc. The annual budget totals €1million. The infrastructure for technological and innovation transfer and the organisations specialising in the spreading, transfer and capitalisation of the economy of research-development results has been neglected during the late 1990s, according to the latest Trend Chart country report from Romania (March 2003).

In **Slovenia** the new R&D Law mandates that the member of the National Science and Technology Council, a policy-making body, be chosen as follows: 6 members of the research community, 6 member of the Ministry of Economy and various industry representative, one social partner (representing labour) and one representative of the civil society (NGO and other organisations).

European Trend Chart on Innovation



Compared to the composition of the Council in previous years, this new membership is very likely to foster policies more favourable to innovation and competitive research.



5. Stimulating an entrepreneurial culture

5.1 Entrepreneurial approaches

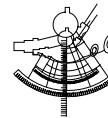
This section of the report presents insights gained by the Trend Chart country correspondents from the last round of country reports (March 2003) that deal with national efforts to 'stimulate an entrepreneurial approach'. Here the main issues being addressed included what form such efforts take (e.g. business benchmarking, dissemination of best practice including training in entrepreneurial skills) and at whom such efforts were actually aimed (e.g. students and young people, junior employees, the self-employed etc.). Also it must be noted that innovation depends on organisational, social, marketing and other knowledge. It frequently requires intellectual and artistic creativity. 'Organisational innovation', for instance, reflects the recognition that new ways of organising work in areas such as workforce management, distribution, finance, manufacturing, etc. can have a positive influence on competitiveness. Therefore the current round of Trend Chart country reports (March 2003) attempted to also identify any efforts, at the national level, to encourage and support this type of approach towards innovation.

There is a trend emerging at most national government levels aimed at stimulating an entrepreneurial approach, especially in the EU Member States. The breadth or specificity of policy targeting in the promotion of entrepreneurial approaches essentially depends on the general level of innovation policy drive in the country in question. Before moving on to present the main developments in the EU 15+ and Accession Countries, it is helpful to look briefly at the general situation in Europe with respect to stimulating an entrepreneurial culture and the challenges this has posed.

Innovation is an entrepreneurial activity, not a purely scientific or technological activity. It requires action on service delivery, marketing, design and organisational change; it is driven by imagination and opportunity, not just the discovery of new scientific knowledge or technical capability. But while Europe has many bright spots, it still lacks dynamism. It has been argued that this is because, despite efforts on the part of all the countries, the entrepreneurial spirit is generally weak across Europe as a whole. This is one of a number of assertions, that a good deal of Europe's economic tardiness as compared to the US, especially in the formation of SMEs and job creation, has to do with entrepreneurial attitudes. However, strong evidence to support this point of view is still hard to come by. Enterprise is at the heart of successful innovation. Entrepreneurial attitudes - even if not precisely identical motivations - underpin much innovation in public sector organisations. Support for such enterprising attitudes in general should be fostered. This is liable to require new approaches in the educational and vocational training systems, and methods that link innovation management with entrepreneurship are appropriate. If SMEs are to continue to remain an important focus of innovative effort, and of policy interest, then one aspect to highlight here is SME links with universities and other training institutions. Therefore links with higher education institutions and with business services that can assist SMEs' choice and implementation of innovations, and the further development and commercialisation of their own innovative ideas, should be fostered. Also, award systems can be good ways of promoting and diffusing knowledge of good practices, and an example here would be the introduction of awards for innovative SMEs (in 'traditional' as well as 'innovative' sectors), and for SME support services themselves. Information on the drivers of innovation performance, e.g. a 'benchmarking' of emerging trends in the global environment as experienced in different sectors, supply chains, regions and countries, and the responses adopted to deal with these, can contribute to building new capabilities for innovation (EC *Innovation Tomorrow* Report, 2002)¹⁵.

¹⁵ *Innovation Tomorrow - Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda*, 2002, References: EUR 17052, Catalogue Number: NB-NA-17037-EN-C, ISBN 92-894-4549-1:

See http://www.cordis.lu/innovation-policy/studies/gen_study7.htm



5.2 Developments in EU 15+ Countries

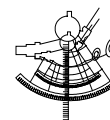
As start-up activity in **Austria**, particularly in the high technology sector, is generally not very dynamic by international standards, the Ministry of Economic Affairs and Labour initiated the 'AplusB - (Academia plus Business-) programme' (coordinated by TIG - Technologie Impulse Gesellschaft). The AplusB impulse programme aims to bring about a sustainable increase in the number of innovative, technology-oriented spin-offs from the academic sector. AplusB Centres assist in the preparation of spin-offs from universities, polytechnics and non-university research institutions by providing professional support for scientists in the difficult process of turning a business idea into a viable business. This involves counselling and assistance during the actual start-up phase and establishing the idea of entrepreneurship more firmly in academic theory and practice. Close links between potential founders and their academic 'home base' ensure that the new companies can exploit the know-how developed in academic institutions.

At national level in **Belgium**, the main action taken has been to push through changes to the legal and administrative framework with a view to strengthening the entrepreneurial culture and increasing the number of new business start-ups. At a regional level, the Flemish government launched a number of actions aimed at improving the capacities of entrepreneurs notably: lifelong learning in the enterprise (education cheques, budget for 2002: €45 million); streamlining of public education suppliers (VDAB, OSP and VIZO), with maximum focus on co-operation and specialisation; accompanying entrepreneurs (advice cheques to attract external advisers, yearly budget: €5 million); learning entrepreneurship (project mini-enterprises for students, business plan contest for students at polytechnics and universities). Also the Brussels government provides a helpful example of an intermediary support structure, where it merged the Technopol (innovation and technology advice organisation) and Ecobru (one-stop shop for business advice) into a new body called the Brussels Enterprise Agency. The merger aims to help start-ups and enterprises to access various types of information and assistance offered by public and private organisations and associations at the regional level.

Denmark provides an example of a so-called contact centre that has been established in each of the 14 Danish counties (Amter). The contact centres act as professional support partners for people inexperienced in establishing their own business. The services of the contact centres are normally without charges. Closely connected with the centres is an Internet portal (www.startguide.dk), which acts as a forum for people who wish to establish a new business. Both the centres and the portal are engaged in the dissemination of management best practice and training in 'entrepreneurship skills', and both address anyone who is looking for support, independent of age, education or line of business.

The **Finland** government's entrepreneurship project was carried out in 2000-2003 by the Ministry of Trade and Industry. The project reflects the political priority given to entrepreneurship and small business creation. Overall, entrepreneurial framework conditions in Finland are considered to be in a fit state. For instance, the availability of funding for new and growing firms appears to have remained at a good level in Finland. However, the motivations of Finnish people to get involved in entrepreneurship remain low despite the favourable conditions for entrepreneurship. The sixth triennial review of the Science and Technology Policy Council 'Knowledge, innovation and internationalisation (2002)', looks at challenges facing Finland and Finnish science, technology and innovation in the coming years. The Council put more emphasis on expanding society-innovation interfaces and on the social dimension of innovation. Also, this review identified that, apart from technological innovation, systematic input into producing social innovations geared towards preventing social development from diverging from economic and technological development is a necessity now and in the future.

The main actor in **France** in the field of entrepreneurial culture is the APCE (Agence Pour la Création d'Entreprises – Agency for the creation of enterprises), which created the OPPE (Observatory of the Teaching Practices in Enterprise) on the joint initiative of the Ministry of Youth, National Education and Research and the Ministry of Economy, Finance and Industry. It has the role of listing, diffusing, and analysing the actions led at all levels of the French education system, which aims:



- to develop the spirit of initiative of the young people;
- to prepare them to lead personal or professional innovating projects;
- to train them to help create new businesses.

Furthermore, the Ministry of Youth, National Education and Research, the Ministry delegated to School Teaching and the Secretary to Small and Medium-Sized Enterprises signed, on March 6th 2003, an inter-ministerial convention entitled 'a shared ambition: to develop the Entrepreneurial Culture' (See: <http://www.education.gouv.fr/presse/2003/pmecp.htm>).

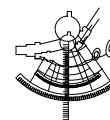
Entrepreneurship in **Germany** is stimulated by many different policy actions including, for example:

- Start-up of new companies supported through various programmes offering grants and loans to new firm founders, both at the Federal level (DtA) and the *Länder* level.
- New technology-base firms are supported by public venture capital programmes (DE 12 and several *Länder* programmes).
- At schools, entrepreneurial thinking is stimulated by various small-scale projects such as Junior (DE 64).
- Firm founders may also apply for funding of consulting services in the start-up stage. Throughout Germany, many incubators offer services and space to new firms. Incubators are typically financed by local authorities or *Länder* governments.

Also the fostering of organisational innovation has received increasing attention in innovation policy. A main effort concerns the improvement of innovation management in East German firms. For all German firms, there are some well-established programmes that provide financial support to SMEs that make use of consulting services aimed at improving organisational innovations.

For **Greece**, there have been significant efforts in attempting to improve entrepreneurship via a high number of grants (e.g. to women, youth, student entrepreneurship), and through a special emphasis on reducing administrative burdens as well through the introduction of entrepreneurship courses in various disciplines at both undergraduate and postgraduate levels of study. In **Iceland** an Annual Innovation Prize is given to the outstanding emerging innovative company of the year, awarded at an annual innovation conference dealing with issues of innovation policies and tools. This was started in 1994 by the Icelandic Research Council (Rannis) and the Icelandic Trade Council. Since then courses in innovation have commenced at various higher education establishments. For the **Netherlands**, the main activities have focused on new entrepreneurs in high technology start-ups and on entrepreneurship in education. Syntens (NL 22) is tasked with this type of support to companies and the regional centres have developed tools to support the management functions of companies. In **Israel**, a network of Centres for Fostering Entrepreneurship operates throughout the country (not restricted to technology). This network is affiliated to the Ministry of Industry and Trade. Entrepreneurship and project management are emphasised in management schools, where there are courses in innovation-oriented thinking. In **Cyprus**, there is a systematic effort to improve entrepreneurship through grants (incubators measure [CY 05], female entrepreneurship [CY 23]). Further support is expected in the framework of the *National Development Plan (2004-2006)* programmes (e.g. youth entrepreneurship).

Ireland has a number of initiatives that seek to promote entrepreneurship at a national level. Similarly, some initiatives aim to foster an entrepreneurial approach at a regional and local level. Examples at a national level include the Back to Work Enterprise Scheme operated by the Department of Social and Family Affairs, which provides incentives for unemployed people to establish their own businesses. Enterprise Ireland promotes the Graduate Enterprise Programmes (IE 23), which provides training and business development for graduates with industrial experience to assist them in establishing new enterprises. Enterprise Ireland also acts as a matching and introduction service between private investors, known as Business Angels (IE 19), and projects seeking equity. The results of national efforts to encourage an entrepreneurial culture in Ireland are reflected in surveys, which indicate that Ireland ranks highly in terms of new enterprise formation. Ireland has been placed sixth in a league table rating entrepreneurial activity in 29 countries and according to the Global Entrepreneurship Monitor survey for 2001, Ireland is the highest placed country in Europe in terms of entrepreneurial activity. Based on the results of the survey, 160,000 people in Ireland are in the process of starting a



business, 110,000 people own or partly own a business and since 1998 five thousand people have indicated that they are planning a new venture, which will employ 50 people after five years. The recognition of the need to develop innovative approaches to improving Ireland's competitiveness has led to a number of initiatives to foster organisational innovation. One example of this is the newly established National Centre for Partnership and Performance (NCP), which was set up to support and facilitate organisational change, based on partnership, with a view to harnessing workplace partnership in support of organisational change. In particular, the NCP will be working closely with Forfás on the further development and implementation of the Enterprise 2010 strategy for the promotion of enterprise in Ireland in the 21st century.

The government of **Luxembourg** and some private organisations for stimulating an entrepreneurial approach have introduced several instruments:

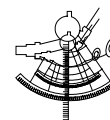
- Innovation Observatory: Aimed at realising benchmarking studies about the different STI policies led and prepared in the EU Member States and abroad, it also seeks to launch benchmark studies at the microeconomic level, by analysing, for example, the innovation processes of the firms, and making case studies which could be used by other firms.
- Promotion of entrepreneurial culture for young people: in 2002 a pilot group 'entrepreneurial culture' has organised information and consciousness-raising days for students. It has also organised the first 'mini-enterprises' and entrepreneurial forum where students have presented company creation projects.
- Luxinnovation GIE (LU 05): essentially an intermediary support structure for enterprises that want to be more innovative.

In **Norway**, recent examples of stimulating an entrepreneurial culture include START Norge, which was established in November 2000 by the university in Trondheim, NTNU, and the Norwegian University of Agriculture, NLH, and has local groups at several universities and colleges covering some 75,000 students. This organisation gathers students for meetings where they can discuss entrepreneurship and get relevant information. In 2002 'Young Enterprise Norway' expanded its activities to also include primary and lower secondary schools and universities. During a period of four years Young Enterprise Norway will develop material, arrange courses for teachers, and promote contact between educational institutions and the business sector. In the early 1990s the Research Council of Norway had great success with the so-called BUNT-programme (Business Development Using New Technologies), a 'technology pull' programme aimed at improving companies' ability to find and use new technology from other firms and research institutions. The programme was copied in several other countries. The focus of the programme, however, turned more towards the training of leaders than the direct use of science and technology.

In **Portugal**, entrepreneurship is seen as an example of a mismatch between discourse and action. In official discourse entrepreneurship is praised as a key factor in improving innovation and social welfare. However, so far there are no wide-ranging and committed policies in this regard. Several initiatives were taken with regard to organisational innovation. Organisational innovation is envisaged as a key ingredient in strengthening Portuguese SMEs' productivity and competitiveness. Three initiatives deserve a mention: LAIO, the Action Line on Organisational Innovation; Innovation Paths, supporting study tours of SME managers, trade unions and employers' associations' representatives to foreign companies known by their excellence in organisational learning; and RIO, the Organisational Innovation Network¹⁶.

In **Spain**, encouraging 'entrepreneurs' and creation of new innovative enterprises are explicit objectives in the R&D National Plan and several initiatives have been carried out, under a network approach:

¹⁶ For further details on these actions, see Elisabete Pereira, Como Potenciar a Inovação Organizacional nas PMEs? work carried out under PROINOV Training Programme, 2002; and Vitor Corado Simões, Monitoring, updating and dissemination developments in innovation and technology diffusion in the Member States – The TREND CHART: Portugal, October 2001-September 2002, Policy Document Summary, October 2002.



- training and awareness focus: Initiatives like the NEOTEC scheme (ES 29) and the CRECE programme have been designed to promote cultural change in society towards an entrepreneurial approach and to help new entrepreneurs to build their technology company from the initial idea. The NEOTEC scheme includes activities such as, advertising campaigns, workshops and services of technological evaluation of new projects. CRECE mainly provides a training and advisory service to new entrepreneurs.
- on the other hand, the new Law of Universities considers the entrepreneurial approach of universities as a way to push innovation and foresees the start-up of new technology based firms from university research activities.
- new interfaces or infrastructure to stimulate and incubate entrepreneurial ideas: measures designed to boost scientific and technological parks, as new ways to link research and entrepreneurial worlds.

For **Sweden**, increasing knowledge concerning the role of new and small firms' contributions to the economy has over the last ten years initiated changes in the education programmes. Entrepreneurship and innovation management courses have been introduced on a rather large scale at different levels in the education system. At the undergraduate level as well as at the graduate level there have been local initiatives all over the country. In order to create a more general entrepreneurial culture in Sweden, measures have been taken to introduce entrepreneurship as a special subject as early as in primary school.

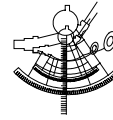
UK measures aimed at promoting a culture of entrepreneurship include initiatives such as the Science Enterprise Challenge – SEC (UK 21) in which business and entrepreneurial skills are taught to science, engineering and technology graduates. Also under this heading can be included the Enterprise Insight Campaign (UK 50). Launched in May 2000, this is promoted by the British Chambers of Commerce, Institute of Directors and the Confederation of British Industry. The campaign targets young people aged between 5 and 30 and those who influence them such as parents and teachers. It aims to encourage the development of entrepreneurial skills and develop the growth of enterprise. The campaign is promoted and developed through a network of 'Ambassadors for Enterprise'. These include entrepreneurs who share their experiences and successes at a wide range of events nationwide. In addition, under the broad umbrella of the HEIF (UK 38), over 70 universities have been supported in a range of activities such as the employment of specialist staff, establishing business incubators, improving the IP infrastructure and providing enterprise training for staff. The Small Business Service also offers a range of services, including benchmarking of best practice in order to stimulate and promote a greater level of entrepreneurship, particularly in SME management.

5.3 Developments in Accession Countries

The spirit of entrepreneurship still seems to be low in **Bulgaria**. However, Bulgaria's national vocational training system includes courses, such as Accountancy and Audit, Economics and Management, Financing, Small Business Management, etc. Students receive basic knowledge and key competencies in areas, such as entrepreneurial skills, business communications, team working, organisational structure and culture, information technologies, marketing, management, foreign language, etc. Selective Bulgarian universities have already specialised courses on how to establish a small company. Moreover, some universities have started to include innovation and entrepreneurship courses and e-Learning programs on e-Business – 'Management for Professionals', in their curricula.

In the **Czech Republic** support for the development of small and medium-sized enterprises (SMEs) by funds from the state budget, through programmes of financial support remains the government's short-term priority. The medium-term goal of the policy for SMEs concentrates particularly on the improvement of the business environment for development of SMEs. They also focus on the reduction of administrative burden in the process of establishing and developing small and medium-sized enterprises and on the creation of a favourable taxation environment.

The **Estonian** government approved, in the beginning of 2002, the document drafted by the Ministry for Economic Affairs and Communications (in co-operation with businesses associations) on Estonian national policy for the development of small and medium enterprises for 2002-2006- 'Enterprising Estonia'. The document defines the institutional structure, principles and measures for state support of SME development: the development of human resources (training and consultation support),



improvement of financing opportunities (start-up support, loan guarantees, etc.). This document also mentions the establishment of incubation centres and industrial parks, in which case 'the state shall support their establishment and long-term investments in the building of the necessary infrastructure'.

In **Hungary** there appear to have been no government initiatives to encourage the establishment of any centres of entrepreneurship or to provide incentives for higher education establishments. However some universities of economic and technical sciences and business colleges are running courses in innovation management, but these are only indirectly financed by the government as every university and college is supported by government funds. Also in **Latvia**, there are presently no programmes created specifically for stimulating entrepreneurship. However, some policy documents do address the fostering of SME activity. For example, in 2000-2002 the Mortgage and Land Bank of Latvia received state guarantees to support SME projects for the amount of €17.1 million. In October 2002 the Cabinet of Ministers passed the approval on further development of the SME crediting programme for another three years and provided state guarantees to the bank amounting to €34 million. In 2001 the Cabinet of Ministers adopted the Action Plan of the Concept on e-commerce, where among the main issues to be addressed are education and support to SMEs. However, as Latvia is only at the early stages of developing an entrepreneurial culture, these efforts are mostly geared towards the creation of a general system and do not specific focus on entrepreneurial activity. In **Lithuania**, business benchmarking and dissemination of best practice does not take place. There are some efforts aimed at providing training in the areas of 'entrepreneurship skills, which are aimed at young people, students, junior employees and the unemployed. The main support structures are business incubators.

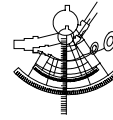
The main goal of the **Polish** Government's economic strategy is to re-activate the Polish economy and bring down unemployment figures. To achieve this goal the government needs to change the legislative system to facilitate the operation of existing enterprises and the creation of new companies. In January 2002 the Council of Ministers adopted the package 'Entrepreneurship First of All'. The package is a proposal of legal instruments to expand and develop existing companies, as well as to create new companies, organised into the following thematic groups:

- Simplification of the tax system
- Increase the productivity of the labour market, by means of lowering labour costs and making the job market more flexible.
- Simplification of the social security system.
- A review of procedures, instructions and other internal regulations, meant to remove the potential barriers between official administrative offices and entrepreneurs contacts.

Romania has introduced a number of schemes promoting entrepreneurship and for supporting start-ups recently. One example of such activity, which covers all regions, is the Grant Support Scheme, introduced in 2002, for start-up businesses, micro enterprises and new SMEs under the joint EU-Romania programme for economic and social cohesion. The public grants must not exceed 60% of the total costs of the project. Also the National Council of Private SMEs agreed special partnerships for SMEs having access to credits with a number of banking institutions in Romania. Some progress has been made in the area of economic research on innovation processes and in the analysis of the national system of innovation. At the national level, the interaction among consumers (workers who are working in the enterprise utilising new technologies, consumers and public sector) and innovation producers (fundamental research, applied research and development activities) has been introduced.

Slovakia recognises the need to improve its business environment. The most important issues affecting the Slovak business environment have been identified and addressed by the government. Access to finance remains the main obstacle to the development of Slovak SMEs. The National Agency for the Development of Small and Medium-Sized Enterprises (NADSME) manages a number of financial support schemes for SMEs including micro-loans and seed capital funds. The central body responsible for the formulation and coordination of SME policy is the Ministry of Economy. The policy of promoting SMEs is focused on the following aspects: improvements in the administrative and regulatory framework, access to affordable loans and more effective and innovative financial instruments.

European Trend Chart on Innovation



In **Slovenia**, the subsidies to Technology Parks (SO 11) and Technology Centres are long-standing innovation measures. Slovenia has currently four technology parks, two in Ljubljana (2) and one each in Maribor and Nova Gorica. Technology parks are incorporated as not-for-profit entities whose aim is to provide a start-up infrastructure to dynamic young technology companies that are just beginning to capitalise on their research. The Ministry of Economy provides annual subsidies, whereas the managers of technology parks advocate for longer financial state commitments, which would allow long-term planning and investment in new infrastructure. A recent innovation measure is the implementation of incubators at universities. While the incubator does not offer seed capital, there are on-going discussions with two entities, the Kmecka Druzba Group and the Horizonte Venture Management, interested in investing in Slovenian start-ups. Another possibility is the creation of a venture capital by several domestic banks. One of the main goals of incubators will be the promotion of entrepreneurial culture amongst students. Also the Slovenian Ministry of Labour, via its employment agency, engaged in entrepreneurial training to promote self-employment amongst people currently registered unemployed.