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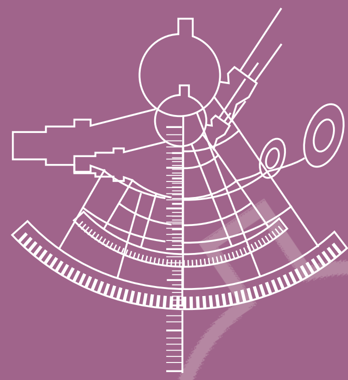

Innovation policy in Europe 2002

Innovation

European Trend Chart on Innovation

A publication from the Innovation/SMEs Programme part of the Fifth Research Framework Programme

Innovation policy in Europe 2002

European Trend Chart on Innovation

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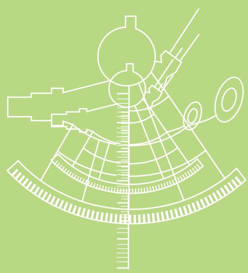


Executive Summary

- *Innovation policy in Europe 2002* draws on recent outputs of the European Trend Chart on Innovation to assess EU Member States' progress towards implementing the practical steps set out in the September 2000 Communication "Innovation in a knowledge-driven economy".

- The Trend Chart is the mechanism through which the Commission supports open coordination in the area of innovation policy. It consists of the Innovation Scoreboard, a database of innovation policy measures, and a series of policy benchmarking workshops informed by detailed country and thematic reports.

- Among innovation policy-makers, awareness of the potential benefits of transnational learning is growing. However, most European governments make no systematic attempt to learn from international good practice. The smaller Member States seem to be more open to learning from abroad.

- The 'cross-departmental' nature of innovation remains an obstacle to effective policy coordination.

- 'Periodic target-setting, monitoring, evaluation and peer review' are implemented to very different extents in different Member States, although the rationale for them is now widely accepted.

- Many European countries have recently adopted measures to improve the transfer of scientific and technological results from public research institutions to industry and to improve the environment for co-operation between them.

- Almost all Member States are actively developing fiscal incentives for innovation, but these efforts are hampered by the lack of a suitable definition of non-R&D innovation activities. The focus on research tends to discriminate against SMEs.

- Many countries now have well-established public sector equity finance support schemes. These often target early-stage academic spin-offs, but there is widespread agreement that such support should be used to leverage private sector investment.

- Policy interest in business incubators is increasingly focusing on improving their efficiency.

- There has been a generally positive response to calls for the establishment of new schemes of entrepreneurship and innovation management education and training.

- Many countries have added a 'third mission' of co-operating with industry to universities' traditional educational and research roles, and are introducing schemes to support the mobility of researchers between public research institutions and private sector companies.

- Progress towards the routine benchmarking of public research institutions' industrial partnership and technology transfer performance has been limited.

- Many countries have launched lifelong learning strategies or action plans, often accompanied by programmes to improve assimilation of new technologies and overcome skills shortages.

- In the candidate countries, entrepreneurs, business associations and science parks are starting to emerge as influential voices in the formation of innovation policy, but stakeholder input is still dominated by the scientific community.

- None of the candidate countries yet has a coherent national innovation strategy with its own budget and implemented through practical measures of real benefit to innovation actors.

- The transfer of innovation policy know-how from EU Member States to candidate countries is progressing but is still at an early stage.

- Most EU Member States now have initiatives to raise public awareness of innovation. 'Foresight' exercises are increasingly involving stakeholders in policy-making.

- A new challenge for European innovation policy is to turn diversity from a source of additional costs into a source of creativity and competitive advantage.

- Interest in transnational policy learning in the field of innovation is increasing in Europe, and the Trend Chart is helping to make it a systematic part of the policy design process.

Introduction

This report assesses Member States' progress towards the objectives set out in the European Commission's Communication of September 2000 "Innovation in a knowledge-driven economy". The report draws on a very large volume of detailed work undertaken during recent years under the three pillars of the "European Trend Chart on Innovation", and demonstrates the Trend Chart's contribution to the implementation of the European Commission's policy priorities.

'The most competitive economy in the world...'

At the European Council in Lisbon in March 2000, heads of state and governments set the Union the ambitious goal of becoming "the most competitive and dynamic knowledge-based economy in the world by the end of the decade". Two years later, in Barcelona, the Council reaffirmed this goal and added to it the more specific but equally ambitious target of raising EU spending on research and development to 3% of GDP by 2010 – with two-thirds of this to come from the private sector.

Seen from the perspective of innovation, R&D spending is an input indicator, rather than an end in itself. Indeed, private sector enterprises invest in research because they believe that its results can be profitably commercialised in the form of marketable products and services. While business expenditure on R&D continues to be an important source of innovation, it is not the only source. The market, new information and communication technologies, human resources – these are other important drivers of innovation in today's knowledge-based economy.

Achieving the goals set by the Lisbon and Barcelona Councils depends fundamentally on Europe's innovation performance. As the Trend Chart's 2001 Innovation Scoreboard showed, the leading EU Member States have already moved ahead of both the United States and Japan on most innovation indicators. The aim now must be to raise the average scores for the Union as a whole, which are currently lagging behind these competitors. This implies continued progress among leading Member States, rapid improvement in the performance of those which are behind, and progress by the largest EU economies, most of which are currently only average performers.

Together with the strategic objectives for the Union, the Lisbon Council introduced a new method whereby the Member States could achieve these objectives. This so-called 'open coordination method' has been conceived as "the means of spreading best practice and achieving greater convergence towards the main EU goals". It involves:

- specific timetables for achieving short-, medium- and long-term goals;
- international benchmarking, using quantitative and qualitative indicators, as a means of comparing best practice;
- national and regional policy targets and measures; and
- mutual learning through periodic monitoring, evaluation and peer review.

The European Trend Chart on Innovation

The Trend Chart is the mechanism through which the Commission implements open coordination in the area of innovation policy. It relies on the 'Group of Senior Officials in Innovation Policy' representing the Member States, and comprises three complementary components:

1. The **Innovation Scoreboard** summarises data on 17 indicators of innovation performance in each Member State, covering four areas – human resources, knowledge creation, the transmission and application of new knowledge, and innovation finance, outputs and markets. By comparing the latest figures with those for earlier periods, successive editions can highlight improvement or deterioration as well as performance in relation to the EU average. The Scoreboard is not an attempt to impose uniform strategies or performance standards, but is intended as a starting point for policy debate and improvement. As the 2001 edition made clear, "copying policies of the leaders would be a misuse of the scoreboard; there is no 'one best way' in innovation policy. A better understanding of the existing 'paths', their priorities and internal logic is necessary. To compare innovation performances and, even more, to assess the transferability of 'good practices', it is essential to understand the specific environments behind these performances and policy practices. All

Member States give high priority to innovation, but they set different priorities. Each country pursues competitiveness, employment, sustainability, regional balance, and reducing social exclusion by its own original policy mix."

2. The Trend Chart's second element is a **database of innovation policy** measures. Freely available on the Trend Chart website, it currently identifies about 700 innovation support schemes, by theme and by country. The database describes each scheme's target group, objectives and mechanisms, gives an account of its successes and problems, and in most cases also names a contact person. Information is collected on an ongoing basis by national correspondents whose annual country reports on each Member State, associate and candidate country(1) are also available on the website.

3. Third, informed by country and thematic reports, **policy benchmarking workshops** proactively address specific topics of policy design or practical implementation. They bring together groups of policy-makers and practitioners from around Europe for the peer review of policy measures and methods in areas of shared interest, enabling them to grapple directly with the opportunities and challenges of transnational policy learning.

The 2000 Innovation Communication

In the global economy, the innovation performance of a region, a country or the European Union as a whole depends to a large extent on decisions made by individual entrepreneurs, company managers and investors, based on their perception of costs, benefits and risks, which ultimately determines the level of innovative activity.

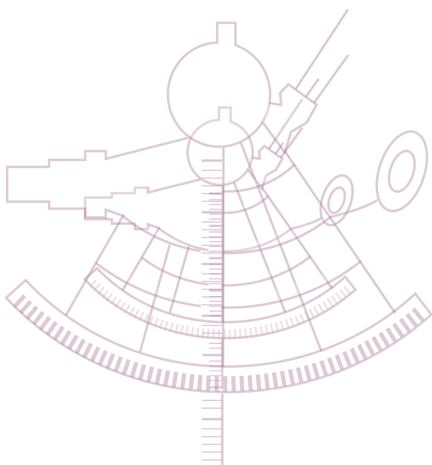
Nevertheless, by removing barriers, balancing incentives, supporting experimentation and ensuring the free flow of information, policy plays a crucial enabling and catalytic role in the innovative process. The European Commission's Communication *Innovation in a knowledge-driven economy*(2), adopted in September 2000, translated the Lisbon summit's goals into priorities and practical steps for Member States in the area of innovation policy.

This report draws on a very large volume of detailed work undertaken by the Trend Chart over the past year and, in particular, on a thematic report which assesses Member State progress towards the objectives set out in the 2000 Innovation Communication. The annual report also demonstrates the contribution of the Trend Chart itself to the implementation of the Communication's policy priorities.

New challenges for European innovation policy

Innovation policy in Europe is evolving rapidly in response to globalisation and the knowledge economy and, as a result, a greater priority is being accorded to it by EU, national and regional authorities. The contours of a renewed European innovation policy are emerging. Typical European challenges will have to be tackled, such as managing diversity, lowering the barriers for transborder clusters, stimulation of the public sector as a driver of innovation, and the need to underpin enlargement with a set of tools to rapidly enhance the innovation capabilities of the candidate countries.

This examination will require close collaboration between Member States and the Commission, as well as further development of the method of open coordination in the area of innovation policy. The Trend Chart, and the Group of Senior Officials from Member and Associated States who assist the Commission with this task, may become the basis for this further development.



(1) *The European Trend Chart on Innovation 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. In this report the term "candidate countries" refers only to those candidate countries covered by the Trend Chart project.*
(2) *COM(2000) 567 final*

1

Chapter 1

Coherence of innovation policies

Coherence of innovation policies

Commission Communication 'Innovation in a knowledge-driven economy', September 2000

Objective 1 – Coherence of innovation policies

Actions by Member States:

✔ National and regional innovation policies should take account of **'best practices'** and adapt them to their specific environment.

✔ Ensure that **coordination mechanisms** are in place between national and regional levels, and between different departments responsible for matters relevant to innovation, so as to guarantee a coherent approach to innovation policy.

✔ Implement **periodic target-setting, monitoring, evaluation and peer review** of regional and national programmes for enhancing both innovation and the bodies which implement them.

The first objective of the 2000 Communication acknowledged the wide diversity of innovation policy-making in Europe, both as an opportunity and as a constraint. The chance to acquire know-how from countries with strengths in specific areas could help those with weaknesses in related areas. On the other hand, the 'innovation paths' of countries are diverse and successful schemes cannot simply be imported. 'Cut and paste' is not an option. Instead, policy-makers must understand the environments for which specific policies have been conceived, and adapt 'lessons from abroad' to their own national circumstances. This creative and interactive process is called 'transnational policy learning'.

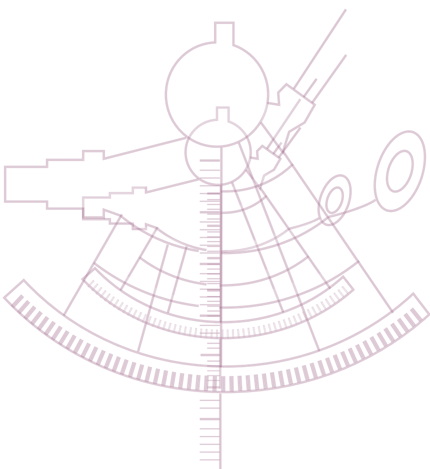
The Communication also drew attention to the institutional and administrative complexity of innovation policy-making. Cutting across the competencies of more than one traditional department or ministry, and indeed of both national and regional governments, effective horizontal and vertical coordination mechanisms are essential ingredients of innovation policy.

1.1 Transnational policy learning

What action had EU Member States taken by the end of March 2002 to "take account of 'best practices' and adapt them to their specific environment"?

The 'general awareness' of the potential benefits of transnational learning in the field of innovation policy is growing. European Commission reports and policy seminars, such as those organised under the Trend Chart, appear to be effective in promoting such awareness.

Outside the well-established exchange mechanisms under the 'Nordic Council', only a few European governments have a well-defined policy of learning from other countries' innovation support measures. Most make no systematic attempt to learn from international good practice, but instead undertake *ad hoc* intelligence-gathering to address particular needs. Irish policy-makers, for example, are currently gathering information on the use of tax credits to promote R&D and the commercialisation of results from public research institutions. The broad comparative study by the Dutch government on the innovation policies of other Member States is a more systematic attempt at transnational policy learning. In the UK, the government produces annual reviews of its innovation performance compared to major competitors and has recently doubled its network of S&T attachés across the world to seek good ideas from abroad (most reports are available on: www.globalwatchonline.com).



Overall, smaller Member States seem to be more open to learning from abroad than the larger economies. However, many policy-makers still hesitate over to what extent lessons from abroad are practically useful and actually transferable. The two extremes of 'not invented here' and 'fashion-led me to' attitudes still prevail. The 2000 Communication has raised awareness, but a systematic step-by-step methodology of transnational policy learning, making allowance for the differences in economic, social, political and cultural context, is still outstanding.

1.2 Coordination mechanisms

What steps have been taken by Member States "to guarantee a coherent approach to innovation policy", both between the central and regional levels of government and across the departmental boundaries?

Coordination of national and regional innovation policies

Germany's federal system divides responsibilities between the Federal government and the Länder in most policy areas. In the field of innovation and technology, the Federal and Länder Committee on Innovation and Technology Policy offers a forum for exchange of information and experience. The Austrian federal system uses similar mechanisms.

In the UK, devolution is a top priority. In innovation policy, Regional Development Agencies have been given specific responsibilities for innovation-related activities. The Swedish Government initiated a process for Regional Growth Agreements in 1997 which were subsequently launched on 15 March 2000 as the principal tool for the implementation of the new regional industrial policy. The Agreements will develop into Regional Growth Programmes in 2004 and should consist of analysis, goal and regional priorities and a plan for financing, implementation and evaluation.

Spain recently created a General Council of Science and Technology to improve coordination between the activities of the central administration and the Autonomous Communities.

Challenges for innovation policy coordination

The inherently 'cross-departmental' nature of innovation remains an obstacle to effective policy coordination. In many countries, the position of innovation at the interface between the spheres of 'science and education' and 'industry' motivates governments to experiment with an 'administrative home' for innovation policy. 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 three 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. 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 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 ministers 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.

Integrated Programme for Innovation (PROINOV)

In May 2001, the Portuguese government set up PROINOV as a coordination structure involving all five ministries dealing with policies related to innovation. Under the chairmanship of the prime minister, PROINOV implements the Lisbon strategy at the national level. The government decision delivers a detailed analysis of the specific weaknesses of the Portuguese innovation system and makes explicit reference to the need for a "horizontal and innovation-driven cross-sector policy". The programme mentions specific policy measures in areas such as R&D, entrepreneurship and lifelong learning, and recognises the need to take innovation into account for tax, labour and regional policies. A permanent monitoring and control mechanism is also part of PROINOV: "The Council of Ministers will meet regularly to analyse the development of the integrated policy for supporting innovation and to decide upon new measures in this area."

1.3 Monitoring and evaluation of innovation support

The rationale for "periodic target-setting, monitoring, evaluation and peer review" is now widely accepted, but is still being implemented to very different degrees.

In the UK, this culture of evaluation and accountability is very advanced. Proposals for new innovation programmes require not only a statement of rationale, objectives, and appraisal, but also viable monitoring, evaluation and feedback mechanisms.

Finland also has a proactive policy-evaluation culture, and since the late 1980s over 60 technology programmes have been evaluated by independent experts. Sweden is currently broadening the evaluation of its research programmes to cover industrial and economic impacts as well as scientific quality, and all larger innovation system programmes are being evaluated continually. In Germany, most federal innovation programmes have monitoring systems and undergo some kind of evaluation.

In Denmark, evaluation remains largely *ad hoc*. In Austria, a non-partisan evaluation 'platform' advocates target-setting as a generalised strategy.

The evaluation culture in 'cohesion countries' is enhanced by evaluation required to meet the obligations of EU Structural Funds. Ireland's National Development Plan for 2000-2006 sets out overall performance indicators for research, technological development and innovation measures. Portugal evaluates all innovation policy measures, not only to assess cost-benefit performance but also as the basis for improvements in future policy-making exercises.

Among candidate countries, Estonia seems to be the most advanced in this respect, as evaluation and monitoring is an integral part of all recent innovation policy initiatives in the country. ■

The UK's ROAME statements

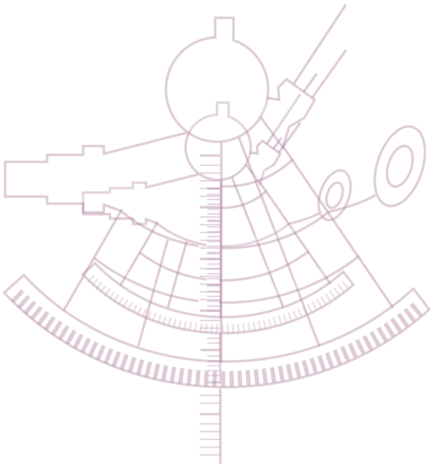
UK government departments use a systematic approach to evaluation, whereby evaluation plays a key role in the policy cycle. Proposals for new programmes are accompanied by a so-called ROAME statement, specifying the Rationale, Objectives, Appraisal, Monitoring and Evaluation elements of the programme. ROAME is a required procedure for all departments involved in support for industrial R&D. The **Rationale** specifies the overall purpose of the programme and how it addresses the problem. **Objectives** provide points of reference against which outputs and impacts from the programme can be monitored and eventually evaluated. The **Appraisal** element details the process and criteria by which projects are selected from a larger number of proposals and are built up into a programme portfolio. **Monitoring** concerns the arrangements [for overseeing progress towards the] achievement of objectives, for individual projects and for the programme as a whole. The subsequent **Evaluation** makes use of all these data in order to provide **feedback** to improve a policy programme.

Related Trend Chart activities and publications

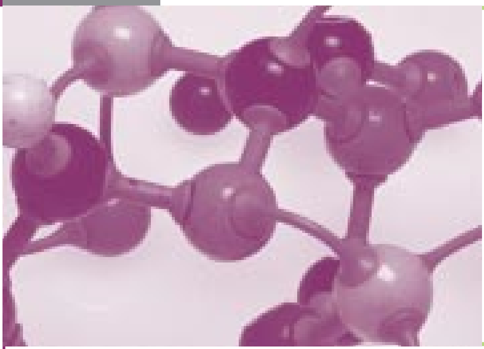
> The first Trend Chart policy benchmarking workshop in 2000 addressed 'innovation policy coordination mechanisms'.

> Since then, recognition has grown that innovation policy needs to be coordinated not only at regional and national level but that Member States' innovation policies should, as far as possible, be coherent at European level. This will require a strengthened commitment to the transnational exchange of experience and mutual learning. The subject of transnational policy learning, and the Trend Chart's contribution to it, is addressed in greater detail in Chapter 6.

> A thematic report on 'Transnational learning in innovation policy', covering the period to March 2002, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Transnational_Learning_March_2002.pdf



Chapter 2



A regulatory framework conducive to innovation

A regulatory framework conducive to innovation

Commission Communication 'Innovation in a knowledge-driven economy', September 2000

Objective 2 – A regulatory framework conducive to innovation

Actions by Member States:

✔ **Adapt the rules for the diffusion of research results from publicly funded research** (licensing, access to foreground knowledge, etc.), to encourage exploitation and transfer of results so as to foster innovation.

✔ Put in place **fiscal measures**, in accordance with Articles 87 and 88 of the Treaty, to encourage private investment in research and innovation and employment of researchers by the private sector.

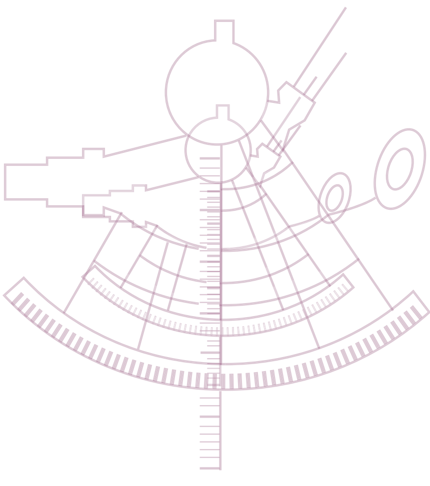
Designing and maintaining a regulatory framework which is conducive to innovation raises important issues of governance. The 2000 Innovation Communication suggested that, while ultimate responsibility must remain with legislators, "consensus-building and self-regulation by enterprises" are important mechanisms to make regulations more "innovation friendly". In the spirit of 'entrepreneurial innovation', the Communication emphasised that "Regulations are useful, but over-regulation is counter-productive". The Commission urged Member States to simplify administrative procedures, and to pay specific attention to those regulations which hamper innovation. It also called on them, when shaping new legislation in any field, to take into account its impact on innovative activity.

The Communication highlighted two particular areas where improvement was needed. The first concerned long-standing regulatory barriers to the exploitation of knowledge generated in the public sector. In many Member States, researchers at public universities and research centres are civil servants and, as such, are often either not sufficiently motivated to exploit the intellectual property rights resulting from their work, or are prevented from doing so. They may also not have the right to take equity stakes in spin-off companies.

The second area concerns the impact of taxes on innovation. All Member States were asked to consider options for introducing or strengthening tax incentives for research and innovation, which currently vary very widely across the European Union.

2.1 Diffusion of research results from publicly funded research

Recently adopted measures to improve the transfer of scientific and technological results from public research institutions to industry address a variety of target groups (researchers, students, enterprises) and a range of topics, including intellectual property rights, networking and innovation finance. In addition, they encompass not only regulatory reform but also initiatives designed to improve the environment in which co-operation between industry and public research takes place.



IPR and other institutional reform

Some countries have introduced over-arching programmes or laws, including a whole range of measures aiming to diffuse public research results. France's 1999 innovation law is an example of such a 'packaged' approach; its evaluation is currently under way.

More specifically, the reform of intellectual property rights (IPR) regulations has attracted considerable attention. Throughout the Union, three different IPR ownership regimes exist, depending on whether the individual researcher, the research institute or the government owns the IPR from public research.

The Nordic countries and Germany have a long-standing tradition of IPR ownership by researchers. Since January 2000, Danish universities, research hospitals, and government research institutions have been given the right to take over their employees' inventions and negotiate licences with private companies. Five professional patent networks have been established to strengthen institutional patenting and licensing skills and to promote co-operation with industry. In 2001, Germany operated a similar shift of the ownership regime. Several Länder have set up agencies that are able to manage IPR commercialisation on behalf of the universities.

In 2001, Spain reformed the legislation governing public sector researchers to facilitate co-operation with commercial partners and the creation of spin-off companies. Overall, there is a trend to grant IPR to research institutions, based on the perception that ministries are too bureaucratic to protect and exploit IPR effectively, while individual researchers lack the time and motivation to do so. However, shifting the ownership regime is not sufficient, but public institutions must also be enabled to make efficient use of their IPR ownership.

Several countries are evaluating options for institutional reform. Ireland is looking at international best practice in the legislative framework for the commercialisation of public research. Sweden is evaluating experience gained abroad in view of a potential change of the IPR ownership regime, already under debate since the early 1990s.

2.2 Fiscal measures

A number of Member States are actively engaged in developing fiscal measures to optimise their innovation systems[3]. Despite widespread acceptance of the 'innovation system approach', incentives targeting innovation activities *per se* are, however, hampered by the difficulty of defining non-R&D innovation activities for tax purposes. During 2002, Spain has been the first country actually planning to address the issue of tax-deductible innovation expenditure, such as investment in innovative equipment, and network creation.

As a result of definition problems, R&D tax credits remain the most widely used fiscal instrument of innovation policy. Belgium, Austria, Italy, France, Luxembourg, Norway and the United Kingdom all operate systems of tax credits or accelerated depreciation for investment in R&D, with the UK extending its successful small firms R&D tax credit scheme to larger companies in April 2002. After 15 years of reliance on grants, there are signs that Portugal too may soon introduce tax credits, while Ireland is currently examining the use of fiscal incentives to promote R&D investment.

The focus of R&D tax credits on knowledge creation tends to discriminate against SMEs which rarely have the capacity to carry out research in-house, and to innovate through activities such as technology transfer, training and

Danish reform of IPR

In January 2000, a new law on patents came into action, making it possible for universities, research institutions and public hospitals to take over the rights to their employees' inventions and to negotiate terms of rights with companies. At the same time, the institutions are obliged to further the commercial use of inventions. An appropriation of DKK 58 million (approx. €7.8 million) covering the period 2000-2003 has been given to support implementation of the law. The establishment of new infrastructures at universities in support of the Act is believed to have considerable strategic significance.

A project has been launched which aims to improve electronic access to patent databases for companies and researchers. The project involves setting up:

- one common entrance to Danish patents and utility models;
- electronic access via CD-ROM/DVD to the Danish Patent and Trademark Office's complete collection of patent information; and
- an internet-based database comprising all available public information from the Danish patent database.

(3) *"Corporation Tax and Innovation", Innovation paper N° 19, DG Enterprise (2002)*

industrial design. This is one reason why some countries have a strong preference for more tightly targeted direct support through grants and loans.

In Germany, for example, corporation tax was reduced significantly for firms of all sizes in 2001, but without any special tax credits on R&D. Federal and regional support for R&D and innovation relies on grants, loans and other direct measures. These are believed to produce greater additionality than fiscal measures, since most R&D investments are made by very large companies whose decisions are less dependent on tax breaks.

The Nordic countries – where private sector R&D expenditure is already high – are equally reluctant *vis-à-vis* tax credits. Tax concessions are generally seen as an inefficient means of encouraging innovation, preference being given to targeted grant funding of research and innovation in specific technological fields. However, tax incentives have been introduced recently for SMEs in Norway, and for certain joint private-public R&D projects in Denmark.

The WBSO tax relief scheme in the Netherlands provides an interesting counter-example. Specifically directed at the costs of staff employed in R&D functions, it enjoys a very high take-up rate and its simplicity makes it particularly attractive to SMEs. Belgium also offers a flat-rate allowance against taxable profits for each additional R&D employee.

Among the candidate countries, Bulgaria, Estonia, Hungary, Latvia and Lithuania all use reduced corporation tax rates as a general means of stimulating enterprise and investment, but only Hungary offers specific incentives for R&D. ■

The Dutch fiscal incentive scheme for R&D (WBSO)

The WBSO aims to encourage business R&D by alleviating the wage burden it imposes via the company's income tax. The measure entails a tax credit of 40% of annual wage costs of R&D personnel for the first €90 000 and 13% for the remainder (with a ceiling). An independent evaluation in 2002 indicates that the WBSO is cost effective: €1 spent on WBSO gives €1.02 in R&D effort. The measure is shown to have a positive impact on the percentage of sales from new products. It helps firms to reach innovation goals, such as the introduction of new products, the implementation of technological knowledge, higher quality products and by increasing the speed of the innovation process. Good-practice elements include:

- WBSO is considered to be easily accessible for companies (low administrative burdens) and therefore attractive to SMEs;
- Implementation is efficient; and
- It has a direct impact on the cost of R&D by alleviating the wage burden, and therefore affects R&D decision-makers directly.

Related Trend Chart activities and publications

> A thematic report on 'Innovation and IPR', covering the period May to September 2001, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Innovation_and_IPR_September_2001.pdf

> A policy benchmarking workshop on 'Innovation policies to promote a more active use of intellectual property rights' was held in Luxembourg in April 2001. A report setting out its conclusions can be downloaded from http://trendchart.cordis.lu/Reports/Documents/TCW3OutputPaperFinal.pdf

> A thematic report on 'Innovation finance', covering the period May to September 2001 and including a section on fiscal incentives, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Innovation_Finance_September2001.pdf

> A policy benchmarking workshop on 'The use of fiscal incentives to boost innovation' was held in Brussels in April 2002. A report setting out its conclusions can be downloaded from http://trendchart.cordis.lu/Reports/Documents/TCW9_Output_paper.pdf

3

Chapter 3

Encourage the creation and growth of innovative enterprises

3 Encourage the creation and growth of innovative enterprises

Commission Communication 'Innovation in a knowledge-driven economy', September 2000

Objective 3 – Encourage the creation and growth of innovative enterprises

Actions by Member States:

✔ Pursue efforts to create a legal, fiscal and financial **environment favourable to the creation and development of start-ups**

✔ Foster, at regional level, the creation or reinforcement of adequate **support services and structures** such as incubators, etc.

✔ Set up education and **training schemes in entrepreneurship and innovation management**, where these do not exist, in higher-education establishments and business schools, and disseminate good practice in this area.

Innovation does occur in traditional industries and in established companies, but it flourishes most profusely among new, technology-based firms (NTBFs). These are high-risk ventures, started by individual entrepreneurs, often spin-offs from research institutions or larger firms, and many remain small or even fail altogether. But NTBFs tend to shape emerging sectors, pushing forward technological boundaries with vigour and flexibility, and those that succeed often do so spectacularly. "From among their number will emerge the successful businesses of tomorrow, providing high-quality jobs and acting as vectors of innovation into traditional sectors," the 2000 Innovation Communication pointed out.

The Communication called on Member States to do more to improve the environment for the creation and rapid development of NTBFs, using both national measures and intensive support for regional technology clusters. A new spirit of enterprise would emerge only when the availability of appropriate support, and the removal of unnecessary barriers, changed attitudes to risk among potential entrepreneurs. The Commission highlighted easy access to seed and early-stage venture capital, to expert business support services and entrepreneurship training, and to scientific and technological know-how as prerequisites. With these in place, self-sustaining innovation systems are likely to spawn increasing numbers of successful NTBFs.

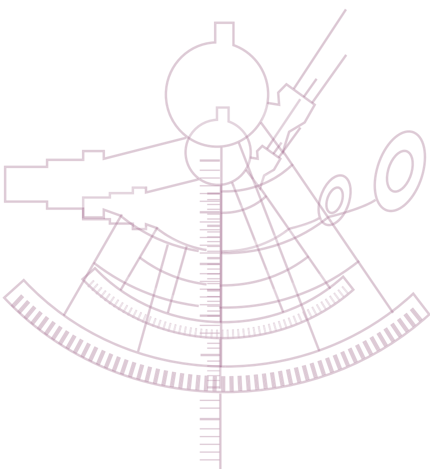
3.1 An environment favourable to the creation and development of start-ups

What action had Member States and candidate countries taken by the end of March 2002 to establish a favourable environment for NTBFs?

Seed and early-stage venture capital

Many countries, with the exception of candidate countries, have well-established equity finance support schemes which are generally of three types. First, through public sector investment in independent venture capital funds, governments can increase the amounts of capital available for investment in companies of specified types, such as NTBFs. Secondly, public sector guarantee schemes make providing capital to innovative firms more attractive to lenders and investors, by reducing their risks. Thirdly, as a response to a perceived failure of the financial market at the very early stages of company creation, public seed financing programmes invest in innovative companies.

In 2001, Germany complemented its well-established array of venture capital programmes by introducing BTU-Early Stage, a new scheme that provides pre-seed venture capital for NTBFs. Similarly, since 2001 the Danish Growth Fund has been allowed to invest directly in single companies and to co-finance NTBFs. The Swedish Industrial Fund has initiated a seed funding programme during 2002. In the United Kingdom, Regional Venture Capital Funds provide risk capital to high-growth SMEs and the High Technology Fund makes capital available to venture capital funds specialising in early-stage technology projects. Through the regional investment company, GIMV, for the past decade Belgium's Flanders region has



"The changing role of public support to spin-offs"

Conclusions of the participants at the Trend Chart Workshop in February 2002

Austria:	welcomed the very valuable contacts at the workshop; special interest in monitoring and evaluation.
Belgium:	current focus on universities, but one should look beyond and involve business; include competitive elements in existing schemes; next meeting should be on indicators for evaluations.
Denmark:	priority on upgrading innovation at universities; learned from Flanders for 'technology-valuation-office'; lessons from the workshop will be very useful for developing the new national innovation policy.
Estonia:	special interest in forecasting and 'technology watch'; would be interested in field visits, e.g. to a 'model' incubator.
France:	focus on spin-off creation and promoting research partnerships; should focus more perhaps on the stage *before:* interaction within the academic milieu, and surrounding networks.
Germany:	focus on initiating business ideas by competitive regional schemes, but encountering problems with availability of venture capital; welcomed the joint European effort at the workshop – "we need more co-operation".
Italy:	forecasting and 'technology watch' may help to make academic research more applicable; watch the national, regional, and local policy levels; a better approach is needed not to copy foreign examples but to adapt lessons to own situation.
Iceland:	will place more attention on spin-off and incubators, also taking into account the 'low-tech dimension'; liked the idea of an "integrated umbrella programme".
Luxembourg:	priority on building an academic infrastructure; two main lessons – need for culture change and for more evaluation.
Norway:	welcomed the very valuable contacts at the workshop; Commission should offer a common framework of definitions to facilitate transnational policy learning.
The Netherlands:	several important lessons: promote spin-off *teams* of researchers and entrepreneurs; give more weight to IPR management; do not forget *non* technology-based spin-offs; evaluation takes time but is crucial.
Sweden:	watch the level of action: national, regional, and local; welcome the exchange of views at the workshop; better indicators and a common framework of definitions would facilitate benchmarking.
Slovenia:	major interest in tax incentives; higher priority should be given to *applied* research and entrepreneurship; lessons from Austria, Germany and Norway most interesting but will be challenging to apply them to the Slovenian context.
UK:	focus on academic spin-offs would be too narrow; welcomed the detailed exchange at the workshop, also on 'tricks of the trade' and, indeed, on problems.

provided incentives for venture capital firms to invest risk capital in SMEs, and supported private initiatives such as Business Angels Networks. From a lower base, Portugal and Greece are both launching new initiatives in the field of support venture capital.

In an increasingly knowledge-based economy, the flow of information between investors and NTBFs is as important as the supply of risk capital. In Sweden, Nutek has launched the Venture Capital Database, an internet-based service to help start-ups and SMEs identify the most suitable potential investors.

Support for university spin-offs

A number of countries have introduced schemes to finance early-stage academic spin-offs. The United Kingdom, Germany and Greece all support such start-ups directly, while Germany has also established a programme to do so through venture capital funds. The rationale for public support for academic spin-offs differs between countries, with some seeing it as a means of increasing returns on public investment in research, and others as a means of accelerating the creation of NTBFs. Such schemes must take their place in a balanced portfolio of innovation support measures, and leadership is needed to identify the correct mix – for example, the balance between pre-incubation and incubation support, and between policies addressing basic and applied research. But the challenge of promoting greater entrepreneurial spirit through cultural change in the academic world is common to all European countries. Spain is conducting a survey to explore the reasons for these problems. Changing attitudes is harder than changing the rules and procedures.

There is widespread agreement that public sector financial support for spin-offs should be used for leverage of private sector investment, that spin-off policies cannot be expected to produce rapid results, and that sector-specific approaches are relatively risky, except perhaps in the field of biotechnology. Finally, effective scheme evaluation is crucial if lessons are to be drawn from experience.

Estonia: SPINNO programme

In response to the low level of commercialisation of R&D results, the Estonian Technology Agency (ESTAG) introduced SPINNO to support the development of a favourable environment for entrepreneurship and innovation at universities and R&D institutions. The SPINNO programme assists two complementary groups of activities: first, activities that directly support the creation and development of knowledge-intensive enterprises – mainly spin-off enterprises; and secondly, it supports activities directed at mechanisms of technology transfer to aid entrepreneurship, such as contract research, patenting and licensing, and co-operation and support programmes. Development of in-house motivation systems supported by administrative framework as well as capacity building of innovation support units at universities and R&D institutions or related with latter structures (technology parks, incubators) are promoted. SPINNO is financed by the government through ESTAG, with a total budget of €1.8 million (for 2001-2003) which covers up to 75% of eligible costs. At the end of 2003 there will be a mid-term evaluation of the programme, the result of which will determine its prolongation.

3.2 Innovation support services and structures

Innovation support services are usually delivered at regional level and include incubators, technology brokerage and cluster and network promotion. Measures to support project-based co-operation between university research teams and industry exist in Portugal, Belgium and the United Kingdom where University Innovation Centres and Regional New Technology Institutes are being established. Portugal, Greece and France have directed support towards technology brokerage agencies and university industrial liaison offices. Support mechanisms within technology transfer and for innovation systems in regions already exist in Sweden.

Policy attention with regard to business incubators is focusing increasingly on improving their efficiency. Germany, for example, is now particularly active in integrating its long-established system of incubators and technology centres into both regional innovation networks and clusters.

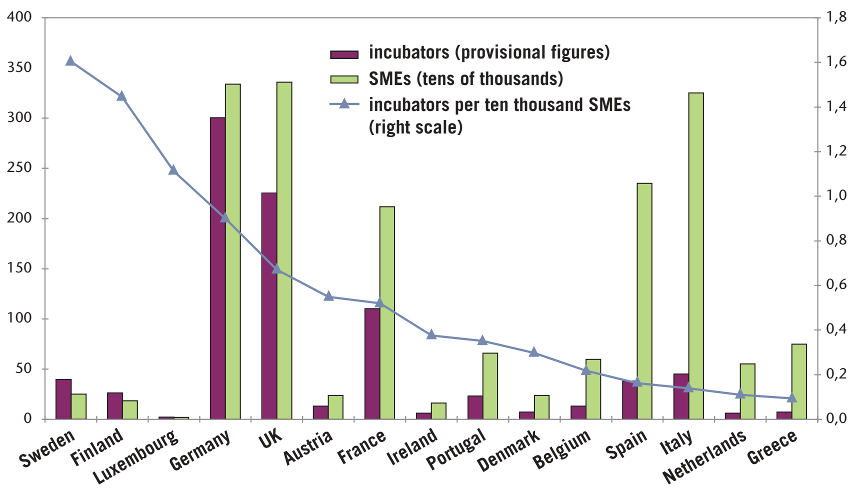
In October 2001, the UK launched a €120-million Incubator Workspace Loan Fund to encourage business start-ups and growth in managed workspace with flexible leases, good communication, and business advice and support. Ireland recently introduced a Third Level Incubation Centres initiative which provides funding for universities and technology institutes to develop and expand incubation space facilities. Finland's Yrityssuomi.fi (Business Finland) network, launched in 2002, could be considered as a 'virtual incubation' service, assisting SMEs and entrepreneurs to access public start-up, development and internationalisation support.

In France, Spain and the United Kingdom, support for incubators is provided regionally – in the case of the UK, through the nine new Regional Development Agencies (RDAs) created there. Denmark has established eight regional technology incubators, working closely with universities and science parks to improve co-operation between public research institutions, NTBFs and investors. It has also set up a number of Approved Technology Service institutes as independent companies offering consulting services for companies and research institutions. In Sweden, a further increase in the number of incubators and in public seed funding is currently under consideration.

Among the candidate countries, Bulgaria, Slovenia, Romania, Cyprus, Estonia and Poland have all begun to set up incubators, often linked to technology parks and targeting technology-oriented enterprises.

Density of business incubators in EU Member States, 2001

Source: CSES, Enterprise DG



3.3 Training schemes in entrepreneurship and innovation management

Entrepreneurship is still in short supply in Europe. Asked whether they would set up a business if there was a risk of failure, 48% of European respondents said no, as against 37% of US respondents[1]. Few young people receive formal instruction about the opportunities and challenges involved in starting a business. Even students and researchers in scientific fields with clear industrial applications lack basic commercial motivation and skills. In response to this shortage, the 2000 Innovation Communication called for entrepreneurship to "become a discipline taught in universities and other institutes of higher education". Similarly, the management of technological and organisational innovation is poorly understood, not only in NTBFs but across the industrial and service sectors. The lack of tools, techniques and skills constitutes a real barrier to the commercial application of new knowledge.

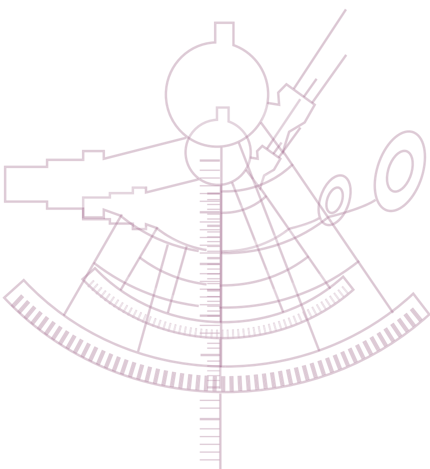
The response to the Commission's call for the establishment of new education and training schemes, and the spread of good practice, has been generally positive. In Portugal, PROINOV has launched an advanced course on innovation policies and management to train 'innovation agents' to promote innovation processes in their organisations and regions. Awareness-raising and training schemes for students and researchers have been developed in 13 countries, though many report implementation difficulties. The number of entrepreneurship chairs at German universities increased from 28 in 2000 to 42 in 2001. Ireland's National Institute of Technology Management, located at University College Dublin, currently runs courses in innovation management. In Belgium, most national universities offer students business start-up training modules, and many also provide programmes and management tools for SME owners and managers. In Sweden, entrepreneurship and innovation management courses have been widely introduced. Linköping and Uppsala have established Centres of Entrepreneurship, and the International Business School in Jönköping now focuses on entrepreneurship and small business management. The United Kingdom has launched a Science Enterprise Challenge to teach business and entrepreneurial skills to science, engineering and technology graduates. Among candidate countries, Bulgaria, Cyprus, Hungary and Latvia have all taken practical steps to provide entrepreneurship and innovation management training. ■

Related Trend Chart activities and publications

> A thematic report on 'Start-up of technology-based firms', covering the period May to September 2001, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Startup20_Technology_Based_Firms_September_2001.pdf

> A thematic report on 'Innovation finance', covering the period May to September 2001, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Innovation_Finance_September_2001.pdf

> A policy benchmarking workshop on 'The changing role of public support to academic spin-offs' was held in Luxembourg in February 2002. A report setting out its conclusions can be downloaded from http://trendchart.cordis.lu/Reports/Documents/TCW6-7OutputPaper.pdf



(1) Flash Eurobarometer No. 107 "Entrepreneurship", Sept. 2001

Chapter 4

Improve key interfaces in the innovation system

Improve key interfaces in the innovation system

Commission Communication 'Innovation in a knowledge-driven economy', September 2000

Objective 4 – Improve key interfaces in the innovation system

Actions by Member States:

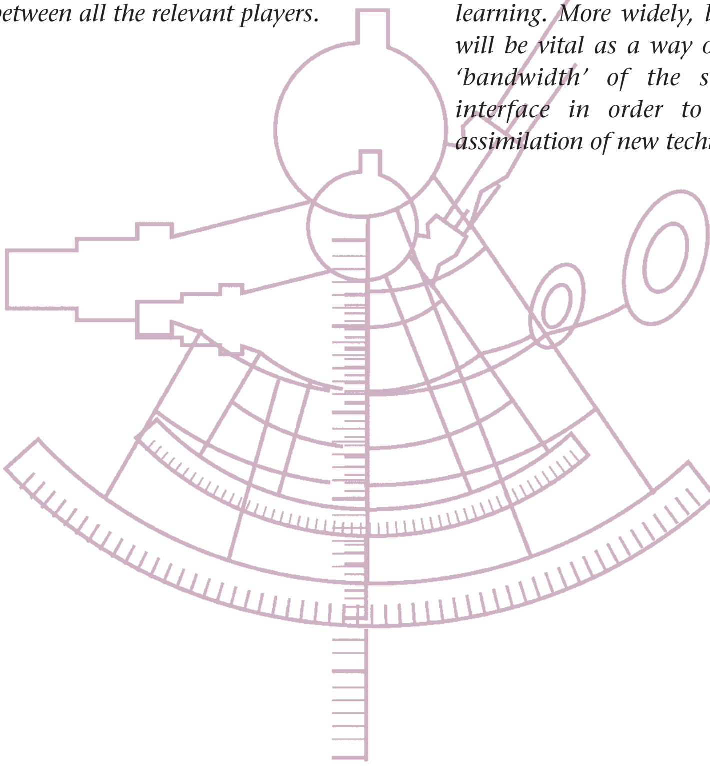
✔ Encourage **universities to give particular attention**, in addition to the traditional missions of education and research, **to promotion of the diffusion of knowledge and technologies**

✔ Encourage **large public research facilities** to benchmark their activities in technology transfer and partnerships with enterprises

✔ Facilitate the implementation of **lifelong learning** programmes to improve the general assimilation of new technologies and remedy shortages of skills

Self-sustaining innovation is neither linear nor singular. It is ongoing, iterative, and involves many actors drawn from a variety of economic sectors, scientific and technological disciplines, and regions. The ease and frequency with which these players can interact is a key determinant of their ability to coalesce into a 'critical mass' of innovative capacity. As highlighted in the 2000 Innovation Communication, public policy plays a key role in facilitating flows of knowledge, ideas, information, services and capital between all the relevant players.

The university-industry interface is crucial. The Communication called for "new relationships [to] be established between public research facilities, universities and enterprises. In addition to their traditional roles in education and research, universities should develop a third mission: promoting the diffusion of knowledge and technologies, especially towards their local business environment." The mobility of research personnel across the industrial-academic divide is a key mechanism for knowledge transfer and inter-organisational learning. More widely, lifelong learning will be vital as a way of increasing the 'bandwidth' of the science-economy interface in order to accelerate the assimilation of new technologies.



4.1 University diffusion of knowledge and technologies

New missions for universities

Many countries now recognise the need for universities to interact more intensively with the business community and, especially where universities have so far had limited autonomy, are modifying the legal framework governing their operation accordingly. Others are implementing more practical measures designed to stimulate university-industry co-operation. Some countries are making progress at both these levels.

Human resources mobility schemes in Europe

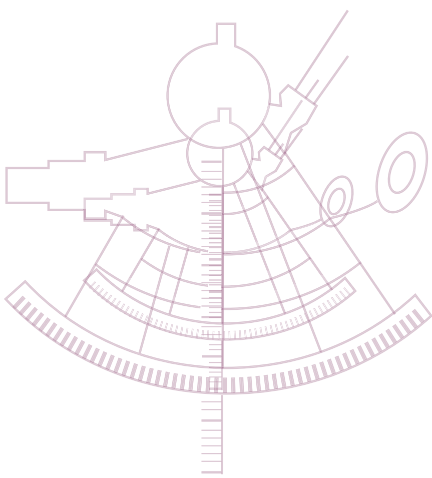
Country	Direct schemes	Indirect schemes
Austria	FFF Young Researchers Programme: www.fff.co.at FWF Impulse projects: www.fwf.ac.at/en/projects/impuls	K Plus and K-ind Competence centres: www.kplus.at K-net Networks of Competence
Belgium	FIRST – PhD Enterprise: http://mrw.wallonie.be/dgtre	
Denmark	Industrial PhD Fellowships: www.vtu.dk	Regional Growth Centres: www.vtu.dk
Finland		Centres of Expertise www.intermin.fi/suom/oske/index_en.html
France	CIFRE: www.anrt.asso.fr/cifre DRT: http://www.recherche.gouv.fr/technologie/mesur/aides/	CNRT – National Centres for Technological Research www.recherche.gouv.fr/technologie/cnrt
Germany	ProInno: www.forschungskoop.de SMEs grants in East Germany: www.fhms.de; www.aif-pfo.de	Networks of Competence www.kompetenznetze.de
Greece	YPER: http://www.gsrt.gr/html/eng/programmes/re_tech/epet2.html	
Italy	Recruitment of public laboratory researchers in SMEs: www.murst.it	
The Netherlands	Knowledge transfer entrepreneurs SMEs	Leading Technological Institutes (LTI): www.minez.nl
Sweden		Competence Centres: www.vinnova.se
United Kingdom	TCS –Teaching Company Scheme: www.tcsonline.org.uk	
Norway	SME Competence Programme: http://www.program.forskningsradet.no/bro/ SME College: http://www.program.forskningsradet.no/bro/	

Sweden's 1996 Higher Education Act added to universities' educational and research tasks the 'third mission' of co-operating with industry. Initiatives include the building of competence centres as joint ventures between universities, industrial firms and research institutes. The Active Industrial Collaboration programme of RTD-related industrial-academic networking projects, launched in 1998, was expanded considerably in 2000. In 1998, Germany, too, added technology and knowledge transfer to the mission of its higher education institutions which receive support in implementing this from federal and regional programmes. Today, almost all operate technology transfer offices. France actively encourages its universities to diffuse knowledge and technologies, and to foster a spirit of innovation and enterprise. It has set up technology platforms to promote innovation and technology transfer within education institutes, while the Technological Research Diploma (DRT) supports the recruitment in SMEs of R&D trained engineers around innovative projects. The United Kingdom is also encouraging universities to diversify from their traditional research and teaching missions. A fund which has helped higher education institutes to develop mutually beneficial links with regional industries since 1998 was incorporated into a new Higher Education Innovation Fund in 2000, tripling its budget.

In Portugal, recognition of the need for universities to interact both with industry and with their regions has been promoted by measures to support research partnerships and the placement of researchers in companies and technology centres, and by the creation of the Industrial Property Support Office, GAPI. Greek universities are strongly encouraged to go beyond their teaching and research missions to provide technological services and launch spin-offs. The Akmon programme will support the upgrading of equipment in those laboratories which co-operate intensively with industry.

Italy, Austria and Norway, meanwhile, have focused on reforming their higher education systems to give universities greater freedom to develop collaborative links with industry, and to increase the mobility of staff between academic and industrial settings.

In Ireland and Finland, the role of universities as drivers of economic growth has been asserted as strongly as in Sweden and Germany, but has raised concern about their ability to meet this new set of demands, and the debate on policy continues.



Human capital mobility

Schemes supporting the mobility of individual researchers between public research institutions and private sector companies are becoming an increasingly important tool for the implementation of universities' 'third mission'. In parallel with contract research, spin-off activity and one-off transfers of technology, temporary placements, industry-funded PhD projects, and other measures to support staff mobility are proving effective ways to foster inter-organisation learning, and to build lasting innovation networks.

A large variety of such schemes is currently being implemented across Europe, involving all types of public and private sector organizations. The emphasis tends to be on mobility from universities to industry, but examples of mobility in the other direction also exist. There is substantial agreement that inter-organisational movements of individuals are an effective mechanism both for the transfer of innovation-relevant knowledge between industry and universities and as a way of improving the innovative performance of SMEs.

Belgium and Sweden are among the countries with long-established schemes to support the mobility of researchers between universities, research institutions and companies. Sweden is extending its provision in this area during 2002-2003 with the creation of 16 new graduate research schools, while Spain recently introduced two programmes to increase mobility in its scientific and technological community.

4.2 Benchmarking technology transfer by large public research facilities

Limited progress has been made towards implementing the 2000 Innovation Communication's call for the benchmarking of public research institutions' industrial partnership and technology transfer performance. Nevertheless, evaluation of these activities – whether formal or informal, regular or *ad hoc* – is widespread.

In 1998, the United Kingdom government commissioned a study of the links between research and innovation at public sector research establishments (PSREs). By the end of the 1990s, Finland had completed the first evaluation round of its large public research facilities, and the VTT Technical Research Centre has recently evaluated the impacts of its R&D activities. All German PSREs co-financed by the federal government have been evaluated by the Scientific Council. This exercise led to cuts in the funding of some institutes, and reforms aimed at improving the technology transfer performance of the Helmholtz-Association of German Research Centres. A 1998 evaluation of Portugal's public laboratories allowed some benchmarking of best practice. Belgium has recently carried out two studies of academic spin-offs, but does not conduct systematic benchmarking. However, the Flanders region's evaluations of its two large research organisations – IMEC and VIB – include performance criteria on interactions with Flemish enterprises as the basis for benchmarking.

France, Sweden, Austria and Norway have only made informal moves towards the benchmarking of public research facilities. In the Netherlands, Ireland, Luxembourg, Greece, Spain and Italy, no such arrangements have been reported to date. Among the candidate countries, Romania, Slovenia and Bulgaria have all taken the first steps towards the evaluation of university-industry interactions.

Evaluation of Germany's public sector research establishments

In Germany, the whole network of PSREs, ranging from fundamental to applied research, has been evaluated over a period of a few years. The objective was not only to look at the performance of individual institutes but also at the performance the PSRE system as a whole. Institutes such as, for example, the Fraunhofer-Gesellschaft (FhG), went through extensive internal and external reviews. The assessment also covered their contribution to industrial innovation, in particular in relation to SMEs. One of the conclusions was that the amount of funding from industrial contracts should rise to approximately 40% in 2005. The evaluation of more scientifically oriented institutes, for example the Max Planck Gesellschaft (MP), focused on their scientific merits. An overall conclusion of international expert panels was that Germany has a good scientific position, but few centres of excellence. The entire system evaluation led to some reallocation of funding and a merger between institutes, which were incremental changes to the system rather than radical shifts in the PSRE landscape.

4.3 Lifelong learning

In the context of an increasingly knowledge-driven economy, the supply of skills to keep pace with accelerating technological progress and technology-driven social and workplace change makes lifelong learning increasingly critical for innovation. At the same time, advances in the field of information and communication technologies (ICT) in particular have provided policy-makers with new tools for the delivery of lifelong learning policies.

There is considerable evidence of lifelong learning's importance as a policy objective in almost every country. Strategies or action plans, often accompanied by programmes designed to improve the assimilation of new technologies and remedy the shortage of skills, have been launched in many countries.

The Netherlands, the United Kingdom and Cyprus have implemented education-based training initiatives. Austria, Germany, the Netherlands, Spain and the United Kingdom have launched schemes of training in ICT. Greece, the Netherlands, Sweden and the United Kingdom have introduced new vocational training measures. Meanwhile, Sweden, Spain, the Netherlands and Poland have put in place a variety of fiscal incentives for lifelong learning. ■

Related Trend Chart activities and publications

> A thematic report on 'The use of mobility schemes in European innovation policy', covering the period December 2000 to April 2001, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Mobility_Shemes_In_Innovation_Policy_September_2001.pdf

> A policy benchmarking workshop on 'Favouring industry-science relationships through human capital mobility' was held in Luxembourg in October 2001. A report setting out its conclusions can be downloaded from http://trendchart.cordis.lu/Reports/Documents/TCWPaperout.pdf

> A thematic report on 'Lifelong Learning – an overview of national measures in the EU Member States and Candidate Countries', covering the period to March 2002, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Lifelong_Learning_March_2002.pdf

Chapter 5

Innovation and enlargement

5

Innovation and enlargement

Enlargement, which will soon see the integration of several new Member States, will change the innovation profile of the European Union considerably.

All available evidence suggests wide disparities between the innovation frameworks and performance of candidate countries and those of the present Member States. Their economies tend to be highly polarised, with technologically advanced foreign-owned companies forming islands of innovation among the larger numbers of technologically weak domestic firms. The creation of new enterprises, although rapid, does not seem to be giving rise to a strong dynamic of investment in high-growth, knowledge-based firms. Furthermore, while public research institutions are relatively strong, they are only orienting themselves slowly to the needs of the new market economies. Candidate country policy-makers acknowledge the long-term potential of innovation as a source of economic growth but often face other – in the short term, more pressing – priorities, as well as limited financial and human resources.

To maintain and eventually increase the innovation performance of the enlarged Union, and to maximise the advantages of an extended European innovation system both to its new and to its existing members, the obstacles to innovation in the candidate countries must be addressed immediately and decisively. This requires resolve by the candidate countries themselves to follow through general policy commitments with budget allocations and practical schemes to address failures of their innovation systems, plus a willingness among current Member States to support these efforts by sharing experience, tools and know-how.

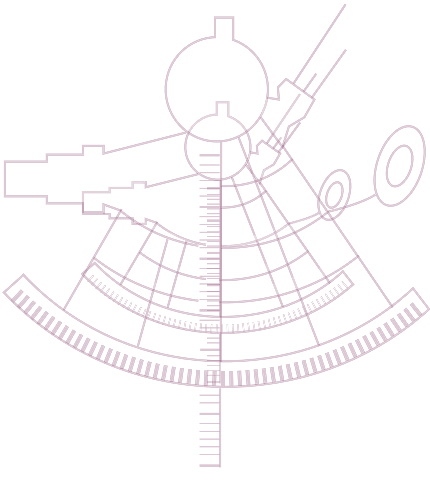
The formulation and delivery of policy is hindered by a lack of appropriate procedures, and by conflict between the various lobbies participating in the policy-making process. In most candidate countries, responsibility for innovation policy has yet to be assigned to any one institution.

5.1 Innovation governance in candidate countries

As in many Member States, innovation governance in candidate countries suffers from the ‘horizontal’ character of innovation policy. Adopting the Finland example, Estonia seems to be most advanced in overcoming the departmental approach to innovation, but problems are still pronounced in other countries.

In terms of the delivery of policy action, only Estonia has a dedicated agency for innovation and technology. Several countries have placed technology funds under the management of intermediaries. Funding for industrial R&D centres or centres of excellence is provided either by ministries for science and education or by those for industry.

Science and technology councils exist in most candidate countries. However, they tend to focus on science and basic research, and business representation on such councils is usually limited. Since 1995, however, new stakeholders in the innovation system have emerged in most candidate countries. Associations of entrepreneurs, business clubs and associations, and specialised institutes and technology parks have sought involvement in the governance of innovation and technology transfer, helping to convince governments of the importance of innovation as a policy theme. Poland, in particular, has developed a number of networking initiatives for innovation and development intermediaries. The EU accession process has also increased the visibility of stakeholders, such as the members of the pan-European Innovation Relay Centre network.



5.2 Policy developments, and the impact of the 2000 Innovation Communication

None of the candidate countries has a fully-fledged innovation policy yet – i.e. a coherent strategy for the improvement of national innovative capacity, with its own budget and being implemented through practical measures of benefit to their innovation actors.

In terms of the range and longevity of existing innovation promotion and support measures, Hungary and Estonia stand out. Turkey, with its annual five-year planning process and related science and technology policy, has a well-developed policy framework. Although Poland and Slovenia have developed sophisticated policy documents, and have carried out innovation surveys, they lag behind in terms of policy implementation.

In a number of countries, recent initiatives appear to be broadly in line with the objectives of the 2000 Innovation Communication, even though they do not refer to it directly. This is the case for Cyprus, Estonia, Hungary, Poland and Slovenia. Significantly, Hungary has launched an initiative tailored to the needs of SMEs with the view of promoting a long collaboration process with large (multinational) firms. Latvia and Lithuania both undertook policy development exercises at the end of the nineties, and it would appear that the Communication has influenced their policy frameworks which were adopted shortly after its publication.

Supplier networks in the Hungarian Integrator Scheme

The Integrator scheme was launched in 1999 with the aim of developing the competitiveness and innovative abilities of Hungarian SMEs. The Integrator scheme supports the creation of networks comprising a large company and its suppliers. Support involves a non-refundable grant which covers 50% of all costs, with no upper limit.

The network has to be structured around a technological development project. The general idea of the policy is to reinforce the capacity of domestic firms to become suppliers for large (multinational) companies, the subsidised project being the first step in a longer collaboration process. This is seen as a means of placing domestic firms on a learning curve, stimulating the upgrading of production processes and managerial practices, and easing their access to global markets. By 2001, 26 Integrator projects were up and running (see: 'Innovation policy issues in six applicant countries: the challenges', Luxembourg, DG Enterprise, 2001).

5.3 Co-operation between EU Member States and candidate countries

The transfer of innovation policy know-how from EU Member States to candidate countries is progressing but is still at an early stage. Geographical and cultural proximity appear to be key determinants of policy transfer partnerships. For example, there are numerous examples of co-operation between the Nordic countries (Denmark, Finland, Sweden) and the Baltic states (Estonia and Latvia), between Greece and Cyprus, Austria and Hungary, and between Germany and both Poland and Slovakia. On the other hand, Romania's cultural ties with France and Italy have not yet resulted in innovation policy transfer efforts, despite established co-operation in other fields. Existing trading links and flows of foreign direct investment (FDI) also appear to be influential. Hungary, one of the largest recipients of FDI in candidate countries, has made considerable progress towards integrating innovation and FDI policies. In this respect, Estonia and Malta have studied the Irish case as an example of good practice.

Although they provide no evidence of completed transfers of innovation policy schemes, the Trend Chart country reports do contain examples of collaboration between EU Member States and candidate countries. There is some evidence that candidate countries prefer the innovation leaders among the Member States, which they consider as "model cases". However, it may be that only candidate countries whose own economic and policy development has reached a certain stage of maturity are able to benefit from co-operation with the most innovative Member States.

As early as 1991 Estonia started studying the structure of Finland's innovation system and creative efforts have been made to adapt this model for its own development. As part of a joint project undertaken by Latvia and Sweden to harmonise Latvian industrial policy with EU requirements, seminars with Swedish experts were organised at Latvia's Ministry of Economy on topics such as venture capital, technology transfer, and university-industry co-operation. Latvia's Chamber of Commerce and Industry and the governmental Latvian Development Agency have also begun to work with Denmark's SME association to train consultants to provide innovation support services for Latvian enterprises. The Plato scheme from Belgium's Flanders region is being launched in two Polish regions during 2002.

In addition, there are several cases of collaboration not associated with any specific policy scheme transfer. Austria and Hungary have engaged in the 'twinning' of innovation-related institutions as a means of stimulating co-operation between their universities and regional technology parks. Like other Nordic countries, Finland has developed a national strategy of co-operation with Estonia, Latvia and Lithuania, as a foundation for increasing economic interaction and more active trade. Finnish experts have been involved in the establishment of a national technology agency and a business development centre in Estonia. Germany, too, has a general policy of contributing to the development of candidate countries' innovation and R&D systems through support for the formulation of market-oriented research and technology policies. Specific collaboration has included projects with Estonia and Poland. Germany also encourages cross-border co-operation in European and other research and innovation programmes. Greece and Cyprus collaborate closely on policy studies, common research and training schemes at the University of Cyprus, and at a technical level in relation to the Cypriot Regional Innovation Strategy project. Portugal has established bilateral science and technology collaboration agreements with some candidate countries, as well as organising innovation- and technology-related seminars as a platform for networking. Sweden has organised SME partnering events with both Estonia and Poland.

Ireland and the United Kingdom have no formal channels for the transfer of innovation policy know-how or schemes, but have established informal contacts with policy-makers in a number of candidate countries. There is no evidence of efforts in this area for Italy or Spain or in the Czech Republic, Lithuania, Romania or Slovakia. ■

Related Trend Chart activities and publications

> A thematic report on 'Transfer of innovation policy schemes to candidate countries' was published in May 2002, and can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Transfer_Policy_Schemes_Candidate_Countries_March_2002.pdf

> A policy benchmarking workshop on 'Innovation policy in candidate countries: towards good practices' was held in Luxembourg in June 2002. Information on this workshop is available on the Trend Chart website.

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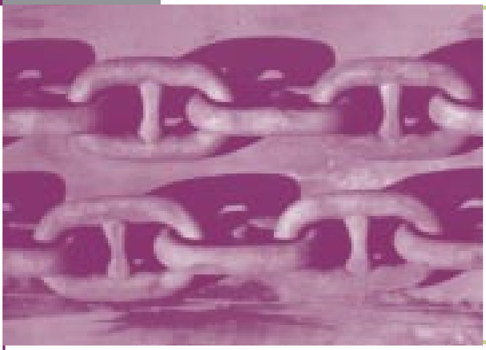
Chapter 6



Towards a new basis for innovation policy in Europe

Towards a new basis for innovation policy in Europe

Commission Communication 'Innovation in a knowledge-driven economy', September 2000

Objective 5 – A society open to innovation

Actions by Member States:

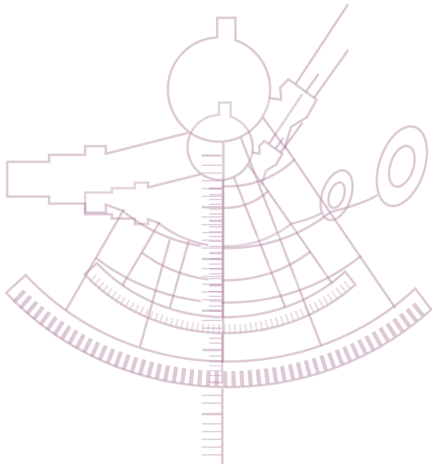
✔ Encourage comprehensive **'stakeholder' debates on innovation** involving scientists, industry, consumers and public authorities.

The success of the Lisbon strategy depends on the capacity of Europe to exploit its ***diversity****. The diversity of innovation practice and performance across the Union is already both a challenge and an opportunity, and both aspects will be magnified by enlargement. A two-tier innovation system cannot deliver maximum economic and societal benefits, and the gap between leaders and laggards must therefore not widen further. On the other hand, the notable success of some countries in particular fields makes it possible for those with weaknesses in these areas to advance rapidly through the transfer of policy know-how, tools and schemes.*

The second emerging policy theme is ***'entrepreneurial innovation'****. Traditional innovation policy-making in Europe has tended to focus on its technological aspects, but today a more market-oriented approach is required. Innovation policy must address not only the suppliers and immediate users of new knowledge but also its indirect beneficiaries, its end-users in business and consumer markets, and the many intermediary organisations, agencies and professions which link these actors together into a cohesive and dynamic innovation 'value chain'.*

The Trend Chart itself provides an increasingly valuable platform for effective transnational policy learning, and in doing so demonstrates and amplifies the third new theme – that of ***innovation governance****. Through the benchmarking of national performance against specific indicators, the regular collection and dissemination of information about current policy schemes, and mutual learning effected through peer reviews, the Trend Chart implements at European level the principle of 'open co-ordination' adopted by the Lisbon Council. The capacity to involve stakeholders in the process of policy design, implementation and evaluation is also critical.*

Over the coming years, the Commission's Directorate-General for Enterprise will undertake a new examination of the factors that influence innovation performance in Europe. The objective will be to secure a better understanding of the process of innovation in Europe. The diversity of national and regional approaches should be taken into account as a source of competitive advantage, to be harnessed more effectively to improve the innovation performance of the enlarged Union as a whole. Such understanding will help to identify those factors where action by public authorities at the local, national and EU levels will have the greatest leverage effect on innovation performance. It should also provide a basis for evaluating the likely effectiveness of public policies and actions before they are actually implemented, and a framework against which their impacts and effects can be measured after implementation.



6.1 'Stakeholder' debates on innovation

Most EU Member States have initiatives to raise public awareness of innovation, although not all governments are equally active. In 'foresight' exercises the trend is towards stakeholders' involvement in policy-making away from purely 'expert-driven' approaches. The following cases are among the most notable recent examples.

Austria recently devoted two of its 'reform dialogues' – which bring together stakeholders from the fields of politics, science and business – to matters of innovation policy. The Austrian Council for Research and Technology Development has launched a new programme which aims to promote the public understanding of the societal and economic importance of research and innovation (www.innovatives-oesterreich.at). France regularly organises national forums on innovation – for example, the recent congress of the National Association for the Analysis of Value (AFAV), jointly organised with ANVAR and the French Space Agency (CNES), included debates on innovation management and the commercialisation of research. The Swedish Ministry for Industry, Employment and Communication arranged a series of "work-level stakeholders' seminars" during spring 2002. Portugal's PROINOV initiative has actively stimulated stakeholder debate on innovation through thematic workshops on innovation policy issues and in the context of cluster development. Germany's federal government also encourages comprehensive stakeholder debates on innovation involving scientists, industry, consumers and public authorities. Notably, the Futur project operates a continuous process of foresight, involving actors from all sectors of society, to identify and discuss future innovation and technology trends.

6.2 New challenges for European Innovation policy

In considering the renewal of European innovation policy, a number of new challenges for the Union must be taken into account:

- Innovation policy should respect European diversity and turn it to advantage. On the negative side, diversity may imply additional transaction costs, communication problems, and difficulty in achieving 'critical mass' in markets for launching innovations. On the plus side, however, the same diversity offers a variety of markets with different characteristics for test launches (the concept of "lead markets"). Diversity is also more conducive than homogeneity to the emergence of a good flow of new ideas.

- Enlargement, leading to the integration of several new Member States, will dramatically change the Union's innovation profile. The available evidence suggests strong disparities in the innovation frameworks and performance of candidate countries when compared to the Member States. The obstacles to innovation in candidate countries must be directly addressed in an effort to raise the innovation performance of the enlarged Union.

- Candidate countries are already involved in the policies and working methods at the heart of the Lisbon strategy. Through participation in the Framework Programme for Research and Technological Development they are participating in the innovation-promoting activities summarised in section 3.1.

- The cohesion principle requires that the aim should be a more innovation-friendly environment throughout the Union. But every region should build upon its genuine competitive advantages. European innovation policy must continuously reconcile the requirements of competition and of cohesion, to arrive at a shared view of what should be done together in order to promote innovation.

European innovation policy must also take into account typically European issues such as:

- The stimulation of the public sector as a driver of innovation.

- Cities as foci of innovation, building on their capacities in the provision of knowledge, skills and a highly qualified workforce.

- The existence of innovative regional clusters in all Member States and of barriers to cross-border clusters.

- Maximising the contribution of SMEs to the EU's innovation performance.

- The full and genuine participation of all stakeholders especially in the case of innovative developments with a social impact.

6.3 Advancing "open coordination" in European innovation policy

Benchmarking national performance against foreign 'good practice' is recognised as a means of mobilising policy-makers and stakeholders, and is becoming more popular as a stimulus to reflection and debate. As outlined in section 1.1, the interest in transnational policy learning in Europe is increasing but, generally speaking, has yet to become a systematic part of the policy design process or based on explicit policy decisions. The Nordic countries seem to have launched a pioneering initiative in this respect.

Towards a new basis for innovation policy in Europe

The "open coordination method" launched at Lisbon aims at generalising good practice learning among the EU Member States. Together with other fora offered by the European Commission in the framework of the Lisbon agenda, the Trend Chart has become one of the platforms where this method is put into practice and further developed. Policy-makers from Member States and candidate countries have found the Trend Chart services useful for comparing their own performance with that of other countries. Participants in the 'peer review workshops' report overall satisfaction with the exchange of experience taking place on these occasions (see, for example, the conclusions of the participants at the workshop on spin-offs tabulated in Chapter 3). The need for "more co-operation" is widely recognised.

Depending on their specific characteristics and relative strengths and weaknesses, Member States concentrate their efforts on different aspects of their national innovation systems and employ different instruments. Small economies face problems – and enjoy advantages – that are different to those of large economies, for example. Countries with traditional strengths in R&D concentrate on the research-industry interface. Countries with emerging national innovation systems try to develop 'leapfrog' potential. Even if available evidence is not yet sufficient to identify a typology of 'national innovation paths' in Europe, it is clear that patterns of innovation differ across Member States and no single innovation policy will fit all Member States.

Such analysis from the correspondents' network fuels the requirement to re-examine European innovation policy, a process which is currently under way. The ultimate objective will be the identification of actions with a major leverage effect on innovation performance that could be appropriately taken at Union level. The process should lead to the development of a specifically European concept of innovation, taking account of the diversity of the phenomenon, the distinctiveness, strengths and weaknesses of national innovation systems, and the particular skills and knowledge that innovation demands. In close collaboration with the Group of Senior Officials, the Commission will undertake the necessary steps to fully develop the potential of the "open method of co-ordination" for the development of a truly European innovation policy.

To proceed in this direction, Member States could be invited to collaborate with the Commission by giving a higher political profile to the existing Trend Chart country reports. The Commission would build on Member State contributions to analyse the innovation process in the Union and the factors influencing it, in order to arrive at a unified process of setting targets by Member States, in liaison with the Commission, and for the continuous monitoring of the progress made. ■

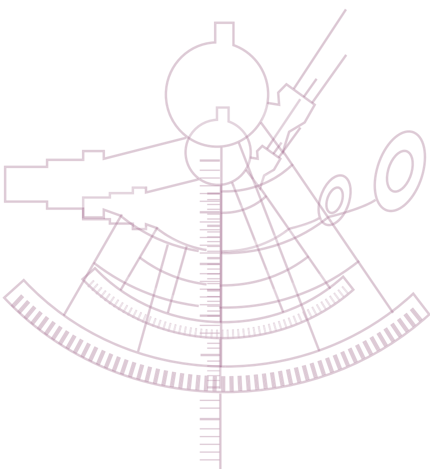
GoodNIP: Good practices in Nordic Innovation Policies

Under the Nordic Council of Ministers, the Nordic countries have set up the Nordic Industrial Fund – *Centre for Innovation and Commercial Development*. The aim of this institution is "to strengthen the Nordic business sector through the creation of a Nordic knowledge market by initiating and financing projects and activities that create synergy between the actors in the Nordic innovation system". In the area of innovation policies the centre runs the GoodNIP project. An expert network compares the innovation policies in all five countries, identifies areas without targeted policy measures, and explores whether this is a result of a deliberate choice or a lack of knowledge and discussion. On the basis of this analysis, GoodNIP will recommend policy measures to further enhance the transfer of good practices. The majority of the GoodNIP experts are also involved in the European Trend Chart on Innovation.

Related Trend Chart activities and publications

> A thematic report on 'Transnational learning in innovation policy', covering the period October 2001 to April 2002, can be downloaded from http://trendchart.cordis.lu/Reports/Documents/Transnational_Learning_March_2002.pdf

> A policy benchmarking workshop on "Improving transnational policy learning in innovation" was held in Luxembourg in November 2002. Information on this workshop is available on the Trend Chart website.



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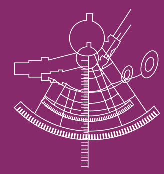

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