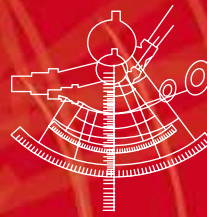




European Innovation Progress Report 2006

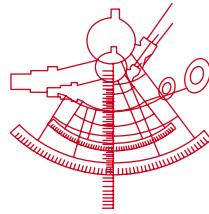


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European Innovation Progress Report 2006



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The present report was prepared by Lena Tsipouri (University of Athens, Greece) Alasdair Reid (Technopolis, Belgium), Anthony Arundel and Hugo Hollanders (MERIT - University of Maastricht) in liaison with the TrendChart policy monitoring network of national correspondents and the European Commission services.

The PDF version of this report is available for download (see: http://www.trendchart.org/tc_synthesis_annual.cfm) and includes summaries of recent innovation policy developments and trends in each of the EU25 as well as the Associated and Candidate countries.

The TrendChart serves the «open method of policy co-ordination» laid down by the Lisbon Council in March 2000 in the field of innovation. 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 (EU). It is also a European forum for benchmarking and the exchange of good practices in the area of innovation policy.

The TrendChart Product

The TrendChart on Innovation has been running since January 2000. It now tracks innovation policy developments in all 25 EU Member States, plus Bulgaria, Iceland, Israel, Liechtenstein, Norway, Romania, Switzerland and Turkey. It also provides a policy

monitoring service for three other non-European zones: NAFTA/Brazil, Asia and the MEDA countries.

The Trend Chart website (www.trendchart.org) provides access to the following services and publications, as they become available:

-  A database of innovation policy measures across 33 European countries;
-  A news service and related innovation policy information database;
-  A «who is who» of agencies and government departments involved in innovation;
-  Annual policy monitoring reports for all countries and zones covered;
-  All background material for four annual policy benchmarking workshops;
-  The European Innovation Scoreboard and other statistical reports;
-  An annual synthesis report bringing together key of the Trend Chart.

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ABBREVIATIONS

ANVAR	<i>Agence Nationale de Valorisation de la Recherche (National Agency for Research Exploitation)</i>
AWS	<i>The Austria Wirtschaftsservice GmbH (Austrian Economic Services Ltd)</i>
AWT	<i>Dutch Advisory Council of Science and Technology Policy</i>
BBW	<i>Federal Office for Education and Sciences</i>
BDPME	<i>Banque du Développement des Petites et Moyennes Entreprises (French Bank for SME Development)</i>
BERD	<i>Business Expenditures in Research & Development</i>
BMBF	<i>Federal Ministry for Education and Research</i>
BMWA	<i>Federal Ministry of the Economy</i>
CEECs	<i>Central and Eastern European Countries</i>
CIPE	<i>Comitato Interministeriale per la Programmazione Economica (Interministerial Committee for Economic Programming)</i>
CIS	<i>Community Innovation Survey</i>
CSF	<i>Community Support Framework</i>
CWTI	<i>Committee on Science, Technology and Information Policy</i>
DGE	<i>General Directorate for Enterprise</i>
EIS	<i>European Innovation Scoreboard</i>
ERA	<i>European Research Area</i>
FDI	<i>Foreign Direct Investment</i>
FGG	<i>Finanzierungsgaraniegesellschaft (Austrian Funding Warranty)</i>
FORFAS	<i>Irish National Policy Advisory Board</i>
GWF	<i>Swiss Science Agency</i>
IDA	<i>Irish Development Authority</i>
IPR	<i>Intellectual Property Rights</i>
MAP	<i>Ministry of Productive Activities</i>
MCYT	<i>Ministry of Science and Technology</i>
MEC	<i>Ministry of Education and Science</i>
MIT	<i>Ministry for Innovation and Technology</i>
MITYC	<i>Ministry of Industry, Tourism and Trade</i>
MIUR	<i>Ministry of Education, University and Research</i>
OCS	<i>Office of the Chief Scientist</i>
OECD	<i>Organisation for Economic Cooperation and Development</i>
R&D	<i>Research & Development</i>
RTD	<i>Research and Technological Development</i>
RTDI	<i>Research, Technological Development and Innovation</i>
SMEs	<i>Small and Medium-size Enterprises</i>
S&T	<i>Science & Technology</i>
SOFARIS	<i>Société française de garantie des financements des PME (French Agency for SME warranties funding)</i>
TAFTIE	<i>The Association for Technology Implementation in Europe</i>
TEKES	<i>National Technology Agency of Finland</i>
TUBITAK	<i>The Scientific and Technological Research Council of Turkey</i>

Note: The Policy Measures in the TrendChart database are referenced by the ISO code of the country and the identification number of the measure. Ex: AT 12 is the Policy Measure number 12 for Austria.



EXECUTIVE SUMMARY

Innovation is about change and the ability to manage change over time. Innovation can be about the successful exploitation of new ideas in the form of a new or improved product or service but it can also be about the way in which a product or service is delivered. Equally, innovation can be about creatively marketing an existing product, or about changing the business model of a sector. Boosting innovation is at the core of the Lisbon Strategy since it is a key determinant of the ability of an enterprise, sector, region or country to remain competitive.

In this context, the **European Innovation Progress Report 2006** provides a summary of the findings and analysis undertaken during 2005 under the umbrella of the European TrendChart on Innovation. The findings are based on empirical analysis of trends in key indicators (the European Innovation Scoreboard 2005 – EIS 2005) and a qualitative analysis of the public policy response to the challenges of strengthening national innovation systems across the 25 Member States of the European Union as well as associate and candidate countries.

This report combines these two approaches by drawing on the findings of the EIS 2005 to **identify for each country up to three key challenges** and then to appraise the extent to which the policy mix in each country is relevant and likely to contribute to overcoming the challenges. Moreover, effective policy requires strong governance processes including the capacities of key stakeholders to work together, access to policy intelligence, independent evaluations of the impact of policy, etc. Innovation policy governance is thus the subject of a specific analysis in chapter two of the report.

The EIS 2005 comes with a strengthened methodology and a revised list of 26 indicators. It confirms that Sweden, Finland and Switzerland are the European innovation leaders, followed by Germany and Denmark. Most of the new Member States are engaged in the catching-up process, however, their slow pace is unlikely to allow for short-term convergence in Europe. In addition, should trends for the 25 Member States remain stable, the innovation gap between Europe and the US will not close, principally due to lower European performance in terms of patenting activity, ICT investments and education levels.

The EIS distinguishes between **five key dimensions of innovation** (innovation drivers, knowledge creation, innovation and entrepreneurship, applications, IPR), which provide further insight into the relative innovation strengths and weaknesses of European countries. Each country has its own agenda; however recent evidence suggests that an even performance on all dimensions is a positive driver for a strong overall innovation performance. This suggests, in particular for **countries lagging behind**, that policy would be more effective in improving overall innovation performance rather than on making further improvements in areas of strengths only.

Even **leading countries** are faced with the challenge to get more out of their good innovation performance. In this respect, innovation efficiency which measures how good countries are at transforming their innovation assets (education, R&D and innovation expenditures) into innovation results (turnover coming from new products, employment in high tech sectors, patents) is of particular interest. Switzerland, Denmark, Germany, Ireland, Italy or the Netherlands are especially high performers in this respect. One possible explanation for their success is that most of them benefit from an above average innovation demand from their population, as measured by the Innobarometer for 2005.

In 2005, the network of TrendChart correspondents appraisal of challenges based on the EIS results and additional national analysis led to **three EIS indicators being highlighted as particularly important** from a policy perspective:

- rates of business expenditure on R&D (16 EU25 and three out of eight candidate/associate countries);
- share of science and engineering graduates (13 EU25 and three out of eight candidate/associate), and
- participation in life-long learning activities (14 EU25 and one candidate country).

Compared to the 2004 exercise, **the identified challenges have not evolved significantly**. This may be in part due to the reliability/up to date nature of indicators which probably influences selection with notably few experts selecting indicators based on CISIII¹ data. It is also not always the case that the countries selecting specific indicators as a challenge are the worst performing in Europe, rather it can often reflect a national debate or concern about declining performance from a high level or relative performance compared to other strongly performing countries (e.g. France and UK on BERD/GDP, Denmark on life-long learning). Moreover, in the countries

¹CISIII: 3rd Community Innovation Survey (see: <http://cordis.europa.eu/innovation/en/policy/cis.htm>)

considered as 'innovation leaders', challenges tend to be less focused on single indicators but rather are more systemic or about 'equalising' innovation performance (e.g. Finland's and Sweden's concern to ensure SMEs take up greater role from flagging large firms).

The importance of these indicators reflect in many respects the political focus on boosting the intensity of innovation enterprises and the increasing emphasis given to the availability of trained people and developing and maintaining skills of employees with respect to new technologies and organisational methods. It is striking that the challenges related to human resource indicators are present in all types of European countries including two of the Nordic countries and Switzerland. Hence, difficulties with ensuring working-age citizens have appropriate technical skills and then maintaining this competence in the face of technological change appears to be independent of levels of economic development. Other factors in the national innovation systems of the countries concerned (teaching methods, promotion of innovation and technical careers, etc.) may provide a better explanation and warrant policy attention.

A single indicator, no matter how important, is insufficient for building a policy framework. Accordingly, the more in-depth analysis of policy developments responding to specific challenges was carried out at the level of the five main groups of EIS indicators:

- ❁ Innovation drivers (indicators on human resources notably the structural conditions required for innovation potential);
- ❁ Knowledge creation (measures of the investments in R&D activities, considered as key elements for a successful knowledge-based economy);
- ❁ Innovation & entrepreneurship (measures of the efforts towards innovation at the level of firms).
- ❁ Application (measures of the performance, expressed in terms of labour and business activities, and their value added in innovative sectors);
- ❁ Intellectual property (measures the achieved results in terms of successful know-how).

The policy response to each of the identified challenges was appraised based on a set of criteria ranging from a systematic and integrated approach responding to the challenge through a comprehensive set of measures to no specific measures addressing the challenge.

Policy responses to challenges in the area of **innovation drivers** generally take the form of broad ranging plans of ministries of education, and there

are few TrendChart measures in this field. The most complete response appear to be in the Netherlands on S&E graduates and in Denmark and Ireland on life-long learning.

As noted above **knowledge creation** is a main challenge for a majority of countries. There is a generalised commitment to raise public R&D investment levels with notably some specific pledges to raise investment annually for the coming years (e.g. Latvia and Lithuania) by a fixed target. On the enterprise side, there is also a new or renewed interest in fiscal incentives visible in 10 out of 19 countries facing the challenge of raising business R&D intensity. National 'innovation funds' aimed at supporting the creation of new high-tech enterprises have been created in Bulgaria, Estonia, Hungary, Italy and Poland. Finally, stimulating greater co-operation and synergies between enterprises and public or academic research centres is given increasing importance with the aim to improve the economic impact of research. This is notably the case in France with the competitiveness poles/clusters but also in Belgium and Greece.

In the field of **innovation and entrepreneurship**, the report underlines that a lot of effort is going on at the policy level to boost access to seed capital for innovative enterprises. Even in countries where access to finance does not appear statistically to be a major challenge, such as Finland. In Germany, a raft of venture capital related measures have been introduced since 2004 and likewise Ireland and the Netherlands have made major efforts to develop policy responses to this issues. In contrast, there is a less visible focus on and efforts to tackle weaknesses on non-technological innovation.

In the area of **application of knowledge**, evolving economic structures with a greater role for knowledge based services versus manufacturing leads to a common thread running across a number of the countries being the need to boost innovation in services as well as in manufacturing industry. This is the case in Belgium, Cyprus and Spain, but often there is only a limited or nascent policy response. This issue of policy to promote innovation in service is the subject of a separate analysis undertaken in the context of the preparation of a TrendChart policy workshop².

Finally, in the area of **intellectual property** despite less than rosy situations in many countries, few identify IPR as a major challenge. Perhaps many of the new Member States and cohesion countries see this as a 'logical outcome' of low levels of investment in knowledge. Policy responses generally take one of

²TrendChart Workshop on innovation in services, Helsinki, 19 and 20 June 2006. For more information, see: http://www.trendchart.org/ws_overview.cfm?id=10



three forms: (a) measures to encourage SMEs to apply for patents; (b) programmes to disseminate patent information; and (c) efforts that encourage public sector research institutions to apply for patents. French and Danish efforts to restructure technology transfer structures and procedures from public research appear interesting for other countries to study.

In all the countries studied there are from one to three ministries involved in policy design and sometimes implementation. Parliamentary committees, advisory councils and executive agencies co-exist with the ministries. In an ideal model, the division of labour between ministries and agencies is a split between policy design (the responsibility of the ministry following political decisions taken by government), and policy implementation (dealt with by the agencies on the instruction of the ministry). However, in practice the border lines between **policy design and policy implementation** are not always clear-cut and in addition in many countries the agencies have an explicit or implicit role in policy design as well.

Innovation governance structures are very diverse. The typical models represented by a broader number of actors include strong inter-organisation co-ordination; strong co-ordination based on hierarchical relations with other policy making and implementation organisations/agencies as well as fragmented systems with more actors following individual agendas, some of them efficiently but with limited synergies and potential friction. Both bottom-up and top-down governance models are encountered. An additional layer of coordination refers to the relations between the national and the regional level. Self-governance of the regions ranges from full autonomy of the three Belgian regions to very centralized structures in Greece, Portugal and some of the new member states; different degrees of federal-regional interaction lies in-between the two extremes in other countries.

It appears that effectiveness and efficiency of the governance system is not related to the type of model adopted and there is not one best practice recommended. The Anglo-Saxon and Nordic countries, which are transforming rapidly into the knowledge economy, demonstrate high growth rates and present above average Lisbon and EIS indicators. The UK is often used as a model. In the Nordic countries there is a long tradition of consensus seeking models. While structures there may differ from the Anglo-Saxon ones there is a systematic effort to involve stakeholders in the decision making process and proceed with a smooth implementation of policy design, since there are no objections once it is adopted.

Over the years there has been **clear progress in innovation governance** with more countries adopting strategic policy making and explicit coordination. Similarly, there is an increasing effort to use appropriate tools for policy making design, in particular organise the collection of the necessary information to systematically evaluate, monitor indicators on national performance and use these indicators together with various other forms of intelligence as inputs for policy design. The UK and the Netherlands are pioneers in that respect, while Germany, Austria and Ireland have adopted intelligence gathering procedures more recently but quite effectively. Transnational learning is also increasing although more between agencies than between ministries, more between cultural and geographical neighbours, more at the level of information exchange than deeper links. The role of international organisations is crucial for this process. But despite evidence on progress made much remains to be done and several countries lie well behind the average.

In conclusion, **innovation is increasingly a political priority across the European countries**, yet innovation policy objectives are still defined very ambiguously. The majority of countries do not set clearly defined objectives and link them to measures. Quantitative targets are limited to the target of "3% of GDP on R&D with business providing two-thirds" inspired by the Barcelona objective. However, in some countries, policy formulation is more systematic with clear objectives, targeting multiple aspects of innovation performance and capacities and taking account of networks and interactions in the national innovation system. In this respect, the Netherlands appears to be a good practice case but this evolution is also evident in newly introduced strategies and action plans in Portugal and Latvia.

Hence, while evaluation at programme level can sometimes provide evidence of whether a programme has reached a certain number of targets it rarely allows policy makers to arrive at conclusions concerning wider impacts of the policy measure on the 'health of the innovation system'. This is the challenge facing innovation policy makers across Europe in the coming years: to appraise and understand the impact of the broad set of policy tools at their disposal for encouraging and supporting enterprises to innovate and to adapt these tools to take account of the constant evolvement of the global market.