

INNOVATION POLICY IN SEVEN CANDIDATE COUNTRIES

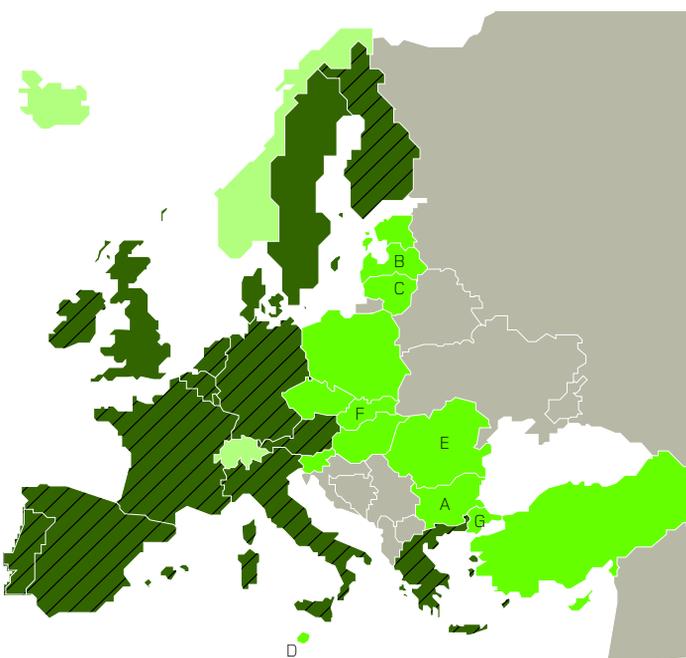
BULGARIA, LATVIA, LITHUANIA, MALTA,
ROMANIA, SLOVAKIA AND TURKEY

HIGHLIGHTS FROM THE FINAL REPORT

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CREATING AN INNOVATIVE KNOWLEDGE-BASED ECONOMY IS A PREREQUISITE ENABLING THE CANDIDATE COUNTRIES TO CLOSE THE EXISTING GAP IN COMPETITIVENESS AFTER JOINING THE EU.

European Union



- European Union
- Economic and Monetary Union
- EFTA
- Candidate Countries

- A Bulgaria D Malta
- B Latvia E Slovakia
- C Lithuania F Turkey

Country Profiles

Bulgaria
 Innovation as an issue discussed by policy makers has been absent in Bulgaria until 2002. There have been only a few isolated measures in favour of innovation and the main focus has been on 'high-tech' real-estate projects. The innovation system is under-developed and essentially driven by public sector funding, business

innovation activity is very weak and a brain drain reduces potential.

Latvia

A debate on how to promote innovation began in the mid-1990s. This culminated with the drafting of a national innovation programme in 2002. There are a relatively large number of innovation related organisations competing for limited funding. R&D intensity in Latvia is low with both public and private expenditure well below EU figures. Latvia has a stronger potential in human resources for innovation than most other candidate countries

Lithuania

An innovation policy has been drafted but there is a lack of serious funding to implement it. A number of key organisations in the innovation system have been developed but they have weak links to firms. Levels of expenditure on business R&D are extremely low and levels of science and engineering graduates are insufficient, although innovation surveys point to a reasonable level of innovation activity.

Malta

Malta has developed an enterprise friendly framework but major differences exist between exporting companies and those focused on the

THE EU HAS SET ITSELF THE STRATEGIC GOAL OF BECOMING THE MOST COMPETITIVE AND DYNAMIC KNOWLEDGE BASED ECONOMY IN THE WORLD BY 2010. IT WILL FOLLOW DIVERSE ROUTES TO INNOVATION IN ACHIEVING THIS GOAL.

small local market. There is innovation policy but a number of policy initiatives in favour of R&D or information society. A few ad-hoc measures have been taken to support innovation. Available statistics on innovation performance are limited but most innovation is concentrated in a few larger firms.

Romania

Innovation policy is still absent but there are a diverse range of programmes in favour of R&D. The innovation system remains dominated by R&D institutes and the development of technology parks. A fragmented business support system with poor sustainability limits the potential to support innovation in smaller firms. Romania performs very poorly in terms of innovation in enterprises and public investment is insufficient.

Slovakia

Slovakian policy is dominated by a 'science push' approach with little focus on innovation in smaller enterprises. A network of industrially orientated R&D institutes have been privatised but are facing a funding crisis. With a few exceptions, the business support system offers very few innovation-related services. Levels of public and private investment in R&D are about a third of the EU average.

Turkey

Turkey has the most sophisticated innovation policy of the CC7. Policy intervention in the field of technology and innovation is a long-standing measure and a number of credible institutions have developed.

Overall view

The CC7 differ in territorial size from Latvia and Lithuania, which are comparable to Ireland, to Romania, which is similar in size to the United Kingdom. The inclusion of Turkey alone would increase the territory of the EU15 by 25%.

The differences in population are also huge varying from the population of Malta, which is approximately the same as Luxembourg; to that of Turkey, which would become the second most populated member state after Germany. Geographically, only one country, Slovakia, is located in central Europe while all the others are to a greater or lesser extent to be found on the periphery of a future enlarged EU.

However, the difficult economic climate is a major disincentive to innovation. The innovation system remains dominated by public sector investment and human capital resources for innovation are weaker than in most other candidate countries.

Competitiveness: the ability of an economy to provide its population with high and rising standards of living and high rates of employment on a sustainable basis

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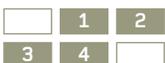
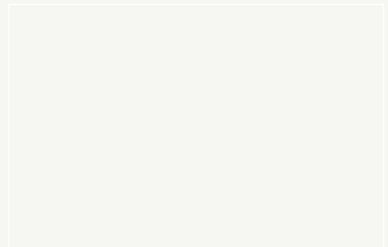
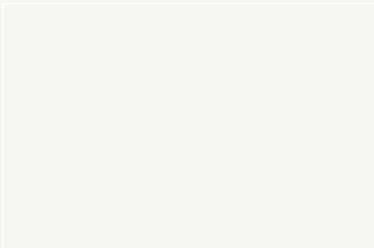
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INTRODUCTION

The EU has placed innovation at the heart of its economic policy objectives since the mid 1990s. This growing emphasis culminated in the new strategic goal - set by the Lisbon European Council in March 2000 - that the European Union (EU) should become the most competitive and dynamic knowledge-based economy in the world, capable of sustaining economic growth with more and better jobs and greater social cohesion by the year 2010.

The Commission Communication of March 2003 on Innovation policy sets out a vision of innovation which integrates diverse factors into a coherent whole. This whole will embrace scientific research, technology development, product design, marketing, organisation structure and training and development. It is against this model that the CC7 countries must measure themselves.

“Innovation is viewed as a multi-dimensional concept, which goes beyond technological innovation to encompass, for example, new means of distribution, marketing or design. Innovation is thus not only limited to high-tech sectors of the economy, but rather is an omnipresent driver for growth.” – Commission Communication of March 2003 on Innovation Policy.



1. Sofia, downtown, Bulgaria
2. Vilnius, oldtown, Lithuania
3. Riga, oldtown, Latvia

4. Valetta, St. John's Co-Cathedral, Malta

Scope of the Study

This study set out to examine and analyse the current framework conditions for innovation in the Helsinki group of candidate countries. This group consists of Bulgaria, Latvia, Lithuania, Malta, the Slovak Republic and Romania, (the CC7). It was the second of two such studies: the first study was carried out during the period June 2000 to September 2001 and covered the so-called Luxembourg Group (the CC6). This second study was carried out during the 15-month period from October 2001 to December 2002.

The analysis was carried out in parallel with the conclusion of the accession negotiations with 10 of the 13 candidate countries which culminated at the European Council meeting at Copenhagen in December 2002. At that meeting agreement was reached to enlarge the EU to 25 countries from 1 May 2004.

The study examined three main themes and a series of selected issues across all seven countries. These were:

The innovation policy framework

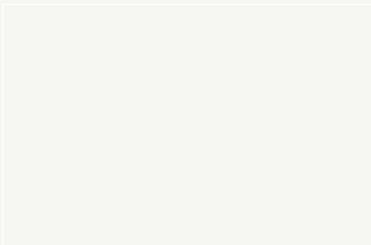
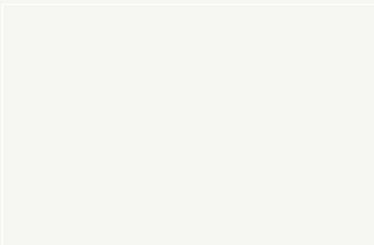
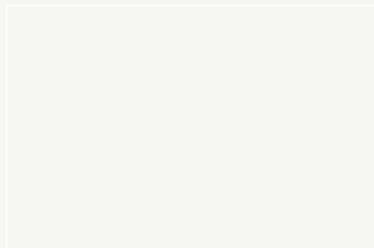
- Identification of major actors in the design and implementation of innovation measures affecting enterprises;
- The main innovation policy developments for the period 1996-2000;
- Review of the legal and administrative framework including competition rules and their applications, administrative procedures to create companies, protection of intellectual property rights, etc;
- Examination and comparative analysis of company tax incentives to promote investments in innovation (technology and intangibles);
- Review of measures aimed at promoting the start-up and development of technology based firms, including financial support (venture capital, loans and grants).

Measures to foster innovation in business

- Examination of teaching programmes and methods (at higher education and life-long learning level) and the training of instructors with a view to fostering an innovation and enterprise culture;
- Review of existing schemes to encourage the secondment of (young) researchers and engineers to enterprises, to help with their innovation and technology transfer projects;
- Review of main support schemes for the uptake of information and communication technologies (ICT) in enterprises.

Business innovation interfaces

- Co-operation between the research community (both University and research centres) and industry, mainly as regards the exploitation of research results;



1. Bucharest, Plaza Building, Romania
2. Bratislava, new housing estate, Slovakia

3. Istanbul, sky scrapers, Turkey

- Co-operation between large firms and SMEs;
- Co-operation between domestic and foreign owned.

The study team carried out an exhaustive analysis of information and data on innovation performance and the policy framework for innovation in each of the countries. The analysis synthesises the opinions and views of over 300 key stakeholders in the CC7, including public authorities, innovation support organisations and business communities whose contributions were collected at national

level through interviews, an innovation policy workshop and an opinion survey in each country.

Innovation Challenges

A first observation in terms of the challenge of integrating the candidate countries into the EU is that the CC7 are, on average, significantly less developed than the CC6 (see figure 1). Average GDP per capita of CC7 is only 61% of the level of the CC6 and only 33% of the EU average. Analysis suggests that this lower level of development in the CC7 has an

important role in explaining the intensity of business innovation and institutional frameworks. However, the attention of Governments and stakeholders has concentrated on building the necessary legislative, regulatory and institutional environment for a functioning market economy. This has comprised a significant effort to change corporate ownership structures, to promote the creation of private enterprises and to improve the functioning of industry and services. These efforts have produced benefits.

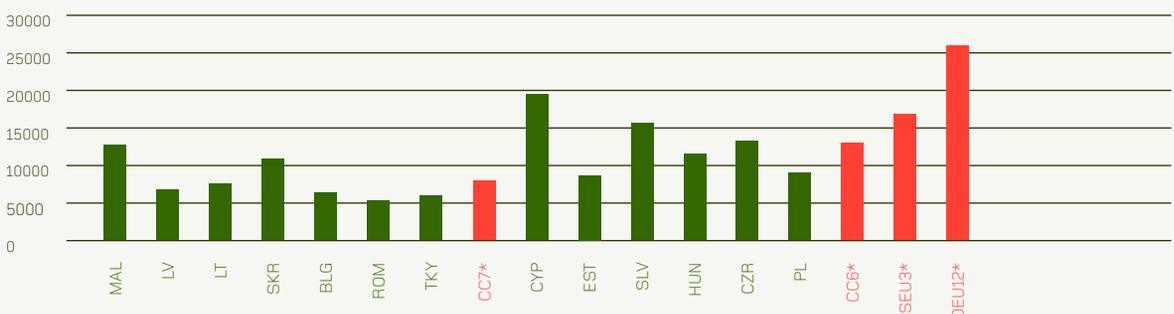
Macro-economic stability – a precondition for innovation

Two key macro-economic indicators play an important role in influencing innovation activities:

- High rates of price increases (inflation) make calculation of future profitability of investment in innovation difficult and create 'wrong' incentives as financial investments often become more profitable than cost reduction and new product development. By 2001, all 13 candidate countries with the exception of Romania and Turkey had inflation below 10%.
- Government budget deficits also create economic instability, increasing the cost of finance and public borrowing may crowd out opportunities for investment in innovation. However, most of the candidate countries have succeeded in reducing the general government budget deficit to below or around 5% by 2000. This source of economic instability and hence of disincentive to innovate remains present however in Malta and Turkey.

Figure 1 – Levels of development in EU and candidate countries, GDP per capita (PPS, EUR) 2000 (* = average)

Source: Eurostat Statistical Yearbook on candidate countries, 2002. SZU3 includes Greece, Portugal and Spain, DEU12 is the EU15 minus the SEU3.



After poor growth performance through the 1990s, growth rates in the period 1999-2002 have outstripped on average those of the EU15 (see figure 2). However much of the more recent growth achieved has resulted from improved cost-efficiency by existing enterprises and through new activities introduced by foreign direct investment (FDI). The creation of new local sources of entrepreneurial value and innovation remains limited.

Sustaining growth will demand facing the challenge of designing and adop-

ting new more complex policy solutions. This is made clear in the Commission Communication of March 2003. The emphasis is placed on diversity and integration of factors. It offers an acknowledgement that the factors influencing innovation will vary in different business sectors.

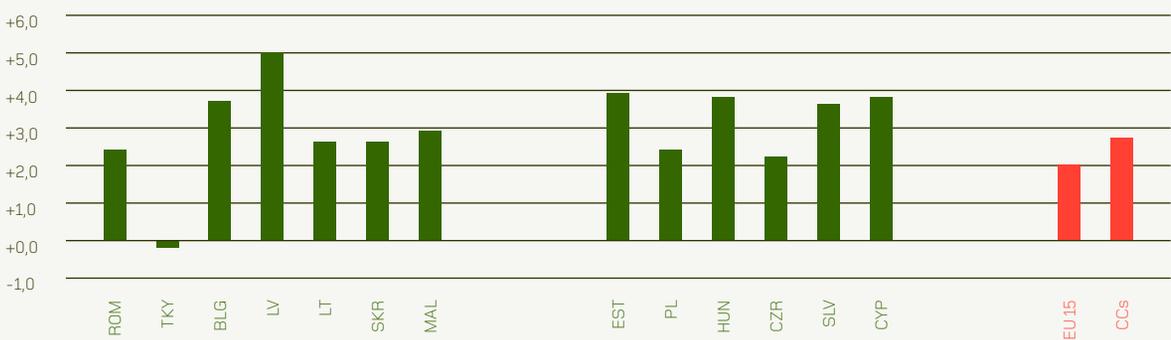
The critical element of such an integrated approach will be identifying and mobilising factors enabling continuous improvement in competitiveness. Innovation, in its diverse and pervasive forms, is a major source of competitiveness. It is not just based

on research or science and technology, or even on enterprise and ingenuity (entrepreneurial skill and knowledge). Innovation also involves managerial and marketing skills and product design together with organisational, social, economic and administrative knowledge. If such factors are not given full and consistent weight successful innovation will be impossible to achieve or to sustain.

The impact of FDI may not always be clear-cut, evidence suggests “technology often transfers through the parent-subsidiary relationship and trade, but that in practice the expected spillover benefits to purely domestic enterprises rarely materialize” – United Nations Economic Commission for Europe, 2002.

Figure 2 – Average rate of growth of GDP at constant prices (1995=100), 1999–2002

Source: Based on Eurostat, Structural Indicators, Jan. 2003.



1 HOW INNOVATIVE IS THE CC7?

Recent structural changes in the majority of the CC7 have been significant. However, they remain insufficient to achieve sustainable growth based on innovation and knowledge. The policy framework which all the countries face grows increasingly challenging. It is no longer enough simply to create a structure for a functioning market economy.

Building stronger national innovation systems in the competitive environment of an enlarged EU will require the creation of new and more sophisticated links throughout economies and societies. These will have to be created between private and public agencies; between firms and suppliers of investment capital and innovation support, and between domestic and foreign markets and enterprises.

The CC7 currently lags on all available measures. Governments, businesses and other agencies will all have to contribute to an improved, integrated performance in order to make progress from the current low base. If current trends persist the CC7 countries will fall further behind in knowledge creation, ability to add value and labour productivity.

Figure 3 - Innovation Index of the Global Competitiveness Report (2002)

Source: Global Competitiveness Report 2002. World Economic Forum. Number between brackets indicates overall position of country index



Current innovation performance is poor. Figure 3 shows the Innovation Index of Global Competitiveness (2002). The CC7 countries are placed well down the table. The comparative performance on labour productivity is similarly far behind the EU. Table 1 shows the 1998 levels compared with the EU15.

Labour productivity can be used a proxy of innovation activity in firms. Latvia, Romania, Lithuania, Bulgaria have rates of manufacturing productivity which are currently less than

40% of the EU level. Turkey and Slovakia perform slightly better. They have rates between 40 and 60% of the EU15 level. The majority of this large productivity gap arises from considerable differences in technology, management and organisation. Improvement in productivity performance will require changes to all of these factors

Domestic entrepreneurship is a key mechanism for generating managerial and technical innovation. However, apparently high rates of entrepre-

neurship in the CC7 group may be misleading. Close analysis suggests that they are mainly an expression of 'survival' rather than exploitation of new innovation opportunities. Firms are increasingly facing supply side problems of limited access to capital and technology and inadequate supplies of trained workers. This suggests that the CC7 economies are entering into a new stage of entrepreneurship where requirements for growth are becoming more diverse and more demanding.

Table 1 – Labour productivity in 1998, EU15=100

Source: Based on Eurostat Statistics in Focus, Theme 2, 13/2001.

	Labour productivity in manufacturing	Labour productivity in total economy
	EU-15=100, 1998	
Group 1	20-40%	>40%
	Bulgaria	Bulgaria
	Latvia	Latvia
	Estonia	Estonia
	Lithuania	Lithuania
	Romania	Romania
	Poland	Poland
Group 2	40-60%	40-80%
	Turkey	Turkey
	Slovakia	Slovakia
	Portugal	Portugal
	Hungary	Hungary
	Czech R	Czech R
	Greece	Greece
	Slovenia	Slovenia
Group 3	80%>	80%>
	Spain	Spain
	All other EU economies	All other EU economies

Table 2 – Candidate Countries Scoreboard 2002 (EU = 100)

Source: Calculated based on 2002 European Innovation Scoreboard: Technical Paper No. 2, Candidate Countries.

For full definition of indicators, see: www.cordis.lu/trendchart

No	Indicator	EU	MT	BG	CY	CZ	EE	HU	LT	LV	PL	RO	SI	SK	TR
1.1	New science and engineering graduates	100	60	46		39	67	44	91	54	58		128		53
1.2	Pop with 3rd level education	100	33	100	126	55	139	66	212	86	55	47	67	50	38
1.3	Life-long learning	100	114		36		62	35	44	192	61	13	44		38
1.4	Employment in medium / hi-tech manufacturing	100	94	73	14	121	63	116	42	23	100	65	115	89	16
1.5	Employment in hi-tech services	100	85	75	51	89	94	90	56	61		40	75	84	
2.1	Public R&D / GDP	100		70	30	81	79	67	79	43	67	15	101	36	79
2.2	Business R&D / GDP	100		9	4	63	12	28	5	16	20	23	65	35	21
2.3.1 A	EPO patents / population	100	2	2	4	8	5	11	1	2	2	1	13	4	
2.3.2	USPTO hi-tech patents / population	100	21	1		5		2	4		0	0	4	2	0
3.1	SMEs innovating in-house	100	35				75		116		9		38		56
3.2	SMEs innovating co-operation	100	44				116		107						161
3.3	Innovation expenditure	100					65				111		105		
4.1	Hi-tech venture capital / GDP	100				9		14	372	258	19		62		54
4.2	New capital	100	213								13				40
4.3	New-to-market products	100	582				92								145
4.4 A	Internet access / population	100	81	24	70	43	96	47	22	23	31	14	96	53	12
4.5	ICT expenditures / GDP	100	51	48		116	120	111	74	99	74	28	59	94	45
4.6	Inward FDI / GDP	100	280	87	78	141	176	143	68	96	70	58	51	80	16

The framework of indicators used by the European Innovation Scoreboard is at [Table 2](#). It suggests that the CC7 lags behind both the CC6 and the EU15 in all four groups of the indicators which are reflected in the innovation scoreboard.

Investment in the creation of new knowledge is the weakest dimension of innovation capability of the CC7. Low investment in public R&D is matched by similarly low investment by the business sector. This very weak performance is likely to continue. Turkey and Latvia have recorded very high relative increases in the last four years. However both started from very low levels. Meanwhile other countries are slipping still further behind in investment in business R&D.

It is difficult to draw conclusion about the transmission and application of knowledge in enterprises.

Data is limited due to the absence or pilot nature of innovation surveys applying the Community Innovation Survey methodology carried out in the CC7. Where data exists it suggests that the share of SMEs innovating is relatively high in some of the CC7 countries. However, this is interpreted as the result of a more intensive search effort of firms for new market opportunities, as opposed to radical innovation. Hence, the CC7 are still lagging behind in terms of economic relevance of innovative activities.

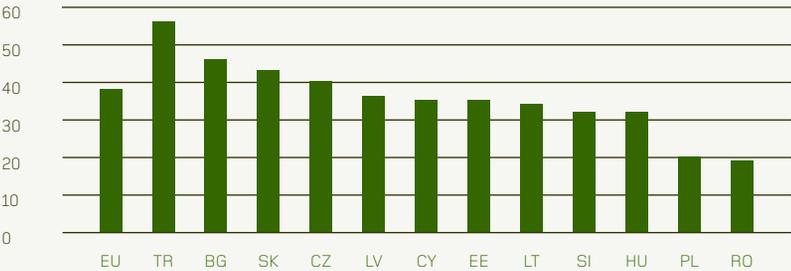
Another major barrier to increased innovation activity in enterprises is the weak financial systems of the CC7. This weakness results in both existing and new technology-based firms being unable to mobilise funds for innovation. New capital raised on stock markets (except in Malta) and from venture capital sources is marginal.

Retained profit is the main means of financing innovation. It is often inadequate to this task.

Analysis of the trends shown by various innovation indicators suggests that the CC7 is falling further behind the EU15 in knowledge-based activities. This is not a result of one single weakness. Performance is weak in a range of factors which influence different dimensions of innovation capability. When brought together into a synthetic measure based on 10 indicators in the Innovation Scoreboard the cumulative impact of this weakness can be seen in comparative performance. The result is set out in [Figure 4](#).

Figure 4 – Innovation Scoreboard Trend (average based on 10 indicators)

Source: Calculations of Study Team based on Candidate Countries Innovation Scoreboard



2 CHALLENGES IN ACHIEVING A KNOWLEDGE-BASED ECONOMY

Most policy measures taken in the candidate countries have been limited to supporting research in specific technologies and their related infrastructure. There have been only tentative steps towards policies focusing on diffusion of innovation and knowledge. Such policies are essential to creating a business environment favourable to innovation.

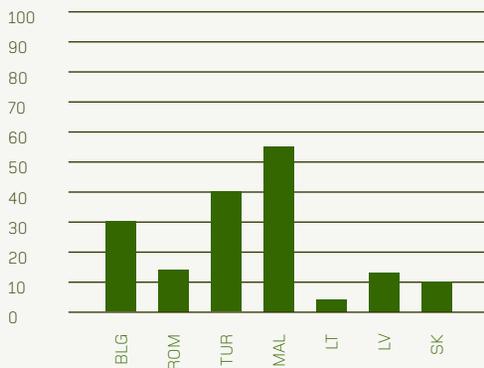
Legal environment for business innovation

The legal and administrative environment is more hostile in the CC7 than in CC6. The front-runner in adopting transparent and efficient business rules amongst the CC7 is Malta. The other countries have also adopted policy documents aiming at reducing business barriers, but the climate conducive to business development in general, and innovative businesses in particular, remains less than positive. Over-regulated systems hamper the development of firms particularly in four of the seven countries, namely

Recent developments do not go far enough to create the right frame-work for successful innovation. Business and other stakeholders are keen to see Governments do more to consult and co-ordinate with partners to develop better structures and processes to support innovation.

Figure 5 – Opinion survey results:

Legal framework for doing business is supportive to firms developing and commercialising new products or services (% agreeing with statement)



Romania, Bulgaria, Lithuania and Turkey. Governments of the CC7 have adopted a variety of measures aimed at improving the business environment. These measures have included:

- improving the company law framework and bankruptcy rules to encourage entrepreneurship;
- reducing red-tape and costs which inhibits start-up of new firms;
- defining new competition policies which eases access to markets;
- reforms to training systems to improve access to lifelong learning;
- clarifying intellectual and industrial property rights frameworks to increase the incentive to invest in research; and

→ improving financial regulations to improve access to and lower costs of capital.

Changes of this type have formed an important part of the broader process of adopting EU or international standards and rules. Consideration of the actual or potential impact on business innovation while this programme has been pursued has been limited.

This missed opportunity has its roots in inadequate contact between policy makers and businesses. Fewer than a quarter of leading private, public and non-governmental stakeholders believe that CC7 governments give

sufficient priority to promoting an innovative society. Only 22% of those surveyed believed that CC7 governments consults the business sector sufficiently to form a view on the impact of policy changes.

As figures 5 to 7 illustrate, leading innovation stakeholders in the seven countries are still dissatisfied with not only the general legal framework for doing business (figure 5) but also with specific legislative and regulatory actions in areas such as intellectual property rights (figure 6). Fiscal regulations and rules also do not contribute significantly to encouraging innovation according to the survey results (figure 7).

The Sunset and Sunrise initiatives in Lithuania

In 2000, the Lithuanian Government set up two inter-ministerial commissions, with participation of the business community, aimed at supporting improvements to the business environment. The “Sunset Commission” worked to identify overlapping and redundant administrative functions; while the “Sunrise Commission” assisted in speeding up the implementation of measures to streamline the functions and procedures dealing with business and economic matters, including those related to innovation. Created as a temporary working group, the Commission has now become permanent and works on a range of issues from taxation, transit and custom, construction regulations, financing of enterprises, public procurement, etc.

Figure 6 – Opinion survey results:

Public authorities provide sufficient support to enterprises on the protection and exploitation of intellectual property rights (% agreeing with statement)

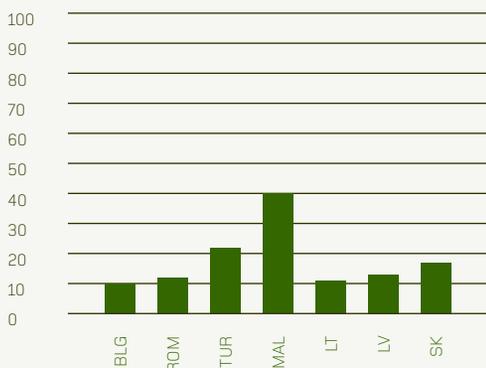
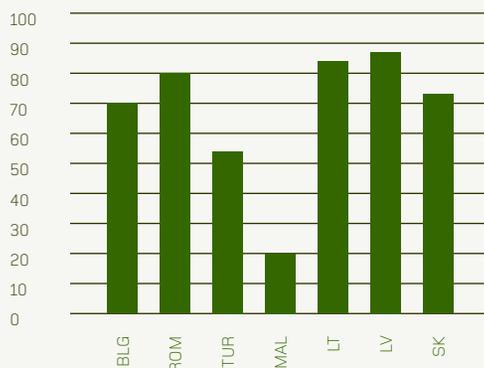


Figure 7 – Opinion survey results:

The tax system encourages innovation in enterprises (% disagreeing with statement)



Building skills for knowledge diffusion and innovation

Successful efforts to overcome these policy limitations could bring rapid advantages. A relatively favourable situation for absorbing new technologies exists, provided that retraining programmes and investment are properly in place.

However, the introduction and diffusion of new technologies is still confined to sectors with a high share of foreign investors. The importance of FDI in each of the national economies is shown in **Figure 8**. A potentially favourable education structure has supported knowledge-based economic growth only in a few metropolitan regions.

Supply side difficulties in recruiting and training skilled workers are evident. Commitment to public expenditure on education varies widely. **Figure 9** shows such spending as a proportion of GDP. High demand for highly qualified workers has been reflected in a growth in the number of students following higher education courses in Bulgaria, Lithuania

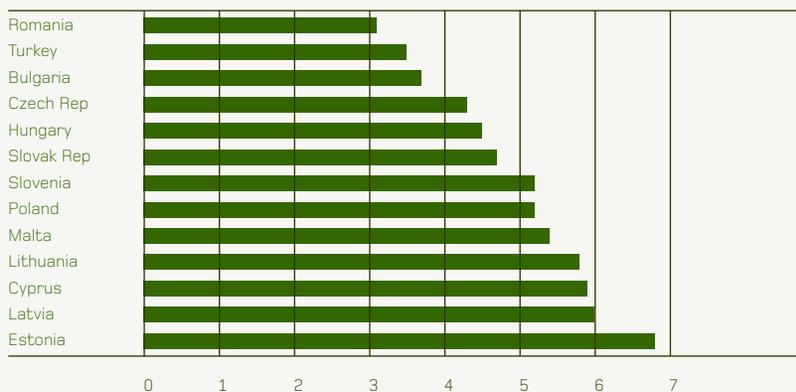
Figure 8 – FDI stock as % of GDP, 2000

Source: Based on UNCTAD, FDI Data Base, January 2003 and World Bank, WDI Jan 2003.



Figure 9 – Public expenditures on education in % of GDP, 2001 or nearest available year*

* For Slovenia, total expenditures



and Turkey. However, the proportion of students following engineering and science courses remains inadequate to meet the full extent of need, which has been made more acute by the reduction of R&D personnel in industry due to cost-cutting and a brain drain of highly skilled researchers to more industrialised countries. There are low levels of investment in

training by enterprises, particularly by SMEs. **Figure 6** provides a comparative indication of the extent to which enterprises engage in training. **Figure 7** shows how the percentage of employees in manufacturing participating in continuous vocational training is low in several of the CC7 countries. Co-ordination between lifelong learning and technology/

innovation policies is insufficient. The anticipation of skill needs related to pervasive technologies such as ICT remains under-developed.

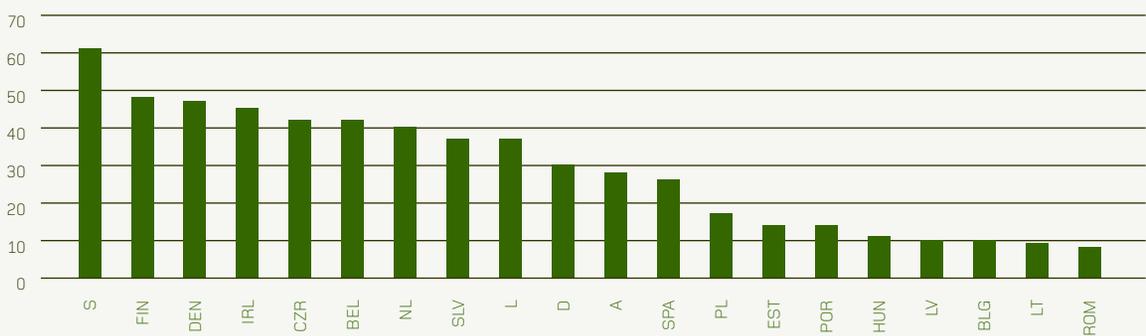
Figure 10 – Training enterprises as a percentage of all enterprises (%)

Source: Eurostat, Statistics in Focus, Theme 3 - 02/2002 and 3/2002.



Figure 11 – Percentage of employees in manufacturing participating in CVT courses, 1999

Source: Eurostat, Statistics in Focus, 8/2002.



**Information technologies
as a driver for growth**

Information and communication technologies (ICT) have a positive impact on productivity, competitiveness and employment. The benefits arise from the capacity to generate new ICT and to diffuse ICT throughout the enterprise sector.

Figure 12 shows that the CC7 is lagging well behind the EU and the CC6 based on performance in Bulgaria, Romania and Turkey. Relatively high-prices of IT-related services and the

pending liberalisation of the telecommunications sector in all candidate countries may explain the large gap in adopting these technologies.

Limited national markets, weak financial resources and difficulties for small companies to link to international networks are additional disadvantages.

Government strategies are in place to try to close the gap. These have several different emphases, but most have tended to concentrate on applying ICT to delivery of existing Government services. The danger with such an

emphasis is that it overlooks the potentially catalytic impact of diffusing ICT throughout the enterprise sector and so providing a stimulus to productivity improvement and the development of new products and services. ICT needs to be applied more widely throughout all the CC7 countries. It must be allowed to do more than simply enhance the delivery of existing services. The value of ICT in improving productivity and developing new products and services must be recognised and applied.

Reinforcing ICT potential: 'Software Parks' and incentives in Romania

In Romania, a significant measure taken to encourage ICT developments is the establishing of software parks in a number of cities. The Information Technology & Communication Ministry aims to attract to the parks mostly small, start-up companies that cannot afford to pay a large amount of money on rent or public utilities. Software companies locating to the park benefit from real incentives both from the State and local authorities that can range from the exemption of income taxes for employees to commercially attractive rents. When the company has sufficiently developed to become self-supporting, another company will take its place in the park.

Another measure supporting the start-up of technology-based companies is the preferential tax payments regarding software and information technology specialists' salaries – which are exempt of taxes on their salaries. This measure is directly aimed at stemming the brain-drain of IT specialists from Romania

Figure 12 – IT expenditure as % of GDP

Source: Eurostat 2001.

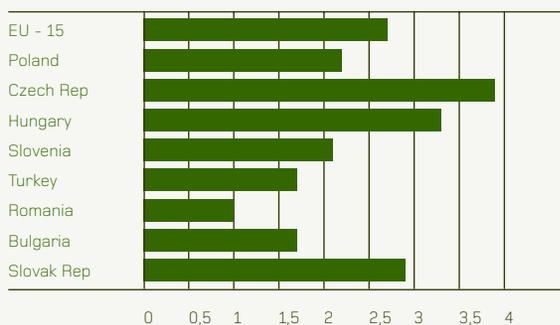


Figure 13 – Opinion survey results:

The government has taken appropriate measures to stimulate the take-up of ICT in enterprises (% disagreeing with statement)



3 POLICIES TO ENCOURAGE INNOVATION IN THE CC7

Policies to close the innovation gap

Innovation has been developed as a policy issue at different paces throughout the CC7. As a result, the level of coherence and coverage of the policy frameworks varies. Turkey has set a most ambitious goal of “establishing a national innovation system” but Bulgaria had only developed an initial innovation policy document in late 2002. The legacy which these strategies must address is a difficult one. During the 1990s, there was extensive “down-sizing” of industrial research capacity and a re-orientation to short-term ‘technical services’ activity.

Policy must be made in a way which brings together all agencies in a method of working with clearly understood competences and accountability. New ideas must not be crowded out by reliance on traditional policy instruments whose suitability has not been proven. Emphasis must be given to enhancing innovation capability throughout economies and civil society.

Figure 14 – Opinion survey results:

Government gives sufficient priority to promote an innovative society in its policy declarations (% disagreeing with statement)



Figure 15 – Opinion survey results:

An innovation policy exists in my country (% disagreeing with statement)



There is a large gap between declarations in support of innovation and implementation and funding. Aside from Turkey and Romania levels of funding to support innovation are extremely low. Such funding is limited in its range. It is mainly focused on research institutes or on the few R&D performing firms in the economy. Little attention has been paid to raising awareness of innovation, improving innovation management

capacities in companies, and ensuring that companies have access to competent advisory.

Funding programmes for collaborative, market-oriented R&D are small. The main focus of attention is on infrastructure linked to universities in the form of science and technology Parks. There are few examples of universities developing commercialisation activities.

The survey of innovation stakeholders sends out a clear signal to governments that if R&D and innovation is to be promoted, it requires not only additional funding (figure 16) but also the extension of existing support for technology transfer and diffusion (figure 17).

Company mentoring by the Technology Development Foundation of Turkey

Since 1991, TTGV has been co-operating with the experts from universities and research institutes to evaluate and supervise technology development projects in industry. A pool of nearly 1500 experts has been formed who visit companies at a regular interval and, in particular, act as mentors for companies with projects supported by TTGV.

This scheme has increased the interaction between science and industry, and created a common ground for future co-operation. In addition, and to further stimulate co-operation, TTGV shares the cost of service purchased by industry from a university and/or a research centre for the projects it supports.

Figure 16 – Opinion survey results:

The level of Government funding for R&D undertaken within, or on behalf of, private enterprises is adequate (% disagreeing with statement)



Figure 17 – Opinion survey results:

Enterprises have sufficient support to facilitate technology transfer (% disagreeing with statement)



Support for New Technology Based Firms (NTBFs) has not been sustained by significant policy measures. Faced by a more negative business environment for high-tech start-ups, the public policy response concentrated on the limited instrument of incubators and ignored other barriers to successful innovation.

The support and development of business networks or clusters remains an embryonic policy concept. Inter-firm co-operation is organised by traditional business federations which are limited in scope and ambition. There are only rare examples of innovation focused co-operation. Barriers to such co-operation are high. They include family ownership

structures and a dominance of key manufacturing sectors by foreign direct investment firms with little in-country innovation established in the CC7 countries.

Figure 18 – Opinion survey results:

There is adequate infrastructure to support new or growing high-technology or innovative firms (% disagreeing with statement)

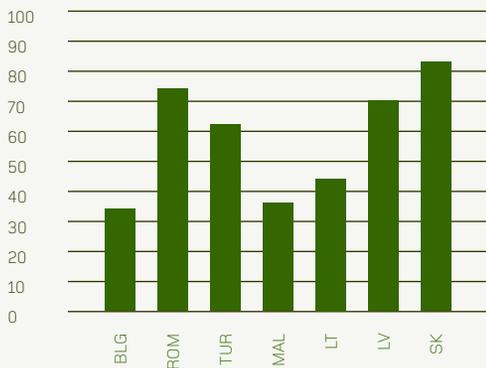
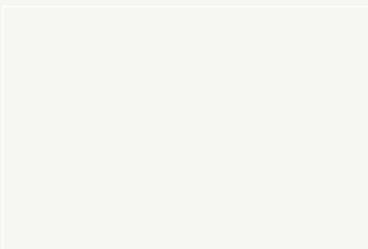
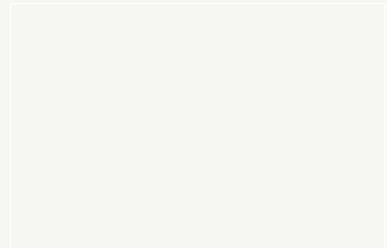
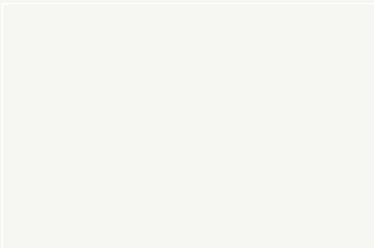
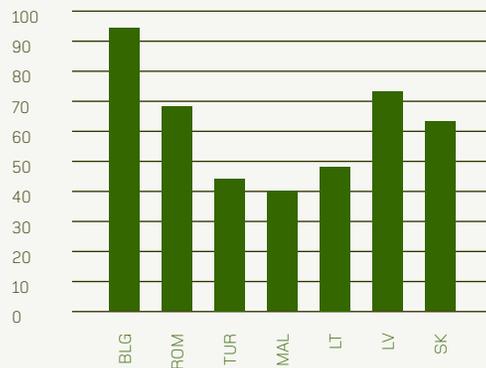


Figure 19 – Opinion survey results:

There is sufficient public funding to support international cooperation of enterprises in the field of research and innovation (% disagreeing with statement)



- 1
- 2
- 3

1. Riga shipyard, Latvia
 2. Rhodia Industrial Yarns, Humenne, Slovakia

3. Klapeda port, Lithuania

Policy-making capacity

The capacity to design and implement more effective innovation policy depends on a number of factors. One is the existence of a clear remit or competence for designing policy. Throughout the CC7 'competition' between the ministries and other governmental organisations for the right to develop policy is evident. Cohesion is consequently lost. **Table 3** shows how competence is distributed and co-ordinated in each country.

Capability is also an important factor. Other than in Turkey the capacities and resources in science, technology and innovation issues within the leading Ministries or agencies is very limited. It has, in many instances, had to be reinforced by EU support. Such limited capability is also stret-

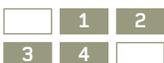
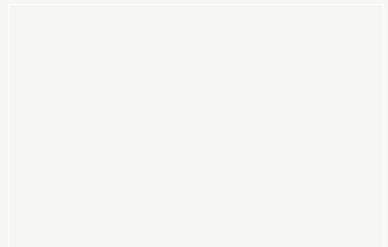
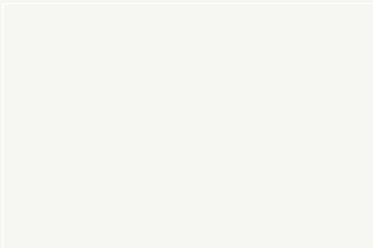
ched by frequent reorganisation of bodies responsible for designing and overseeing policy implementation.

Turkey is also the only country with specialised governmental and non-governmental agencies with a track-record of managing funding and delivering assistance to enterprises for innovation. Although such tasks can be performed by Ministries separate implementation agencies are often at a considerable advantage. This higher level of policy sophistication of Turkey is also reflected in the existence of a "evaluation culture" in the field of technology and innovation policy. Such a culture is not apparent elsewhere.

There is no layer of innovation intermediaries able to counsel and support enterprises. Such organisations can play a key role as

"programme promoters" ensuring that Government funds reach quickly and effectively enterprises targeted. Technology transfer and knowledge diffusion structures have been developed or are planned in most countries; but such structures only offer very limited services to firms. Such structures are usually located only in national capitals: only Romania and Turkey are developing networks of intermediaries throughout regions.

The main elements of the innovation support infrastructure are summarised at **table 4** which shows the key institutions involved in each country.



1. Agency of Vine and Wine, Bulgaria
2. Mosta Technopark, Malta
3. Business man, Istanbul, Turkey
4. Shipyard worker, Giurgiu, Romania

Table 3 – Distribution of competence for innovation policy matters in CC7

Source: Innovation policy Profiles. See volume 2 of this study.

Country	Executive level	Main agencies	Co-ordination mechanisms
Bulgaria	Ministry of Economy – no department for innovation or technology development. Ministry of Education and Science.	Agency for small and medium-sized enterprises (ASME) – no specific remit for innovation.	No co-ordination mechanisms.
Latvia	Ministry of Economy has main responsibility for innovation. Ministry of Education and Science responsible for science & technology policy.	Latvian Development Agency – no explicit remit for innovation.	Latvian Council of Science remit is scientific research.
Lithuania	Ministry of Economy – lead role in innovation. Ministry of Education and Science – responsible for science and technology policy.	Lithuanian Development Agency for Small and Medium Sized Enterprises (SMEDA).	Business Development Council & Sunrise Commission on business environment. Science Council of Lithuania.
Malta	Ministry of Education and National Culture.	Malta Council for Science and Technology (MCST). Institute for Promotion of Small Enterprises (IPSE).	MCST organises consultations on technology and information society.
Slovakia	Ministry of Education and Science. Ministry of Economy.	Agency for the support of Science and Technology National Agency for the Development of SMEs.	Government Council for Science and Technology.
Romania	Ministry of Education and Research (MER), Dept. for Innovation & Technology Transfer.	National Agency for Science, Technology and Innovation absorbed into MER in 2000.	Inter-ministerial council for science, technology and innovation.
Turkey	Science & Research Council of Turkey (TUBITAK).	TUBITAK-TIDEB – grant support for industrial R&D. Technology Development Foundation of Turkey (TTGV) – supporting technological innovation activities in firms. Small and medium sized industry development organisation (KOSGEB).	Supreme Council of Science and Technology (BTYK).

Table 4 – Key actors supporting innovation in CC7

Source: Innovation Policy Profiles. See Volume 2

Country	Technology parks	Industrial R&D, Technology transfer & consulting structures	Innovation & risk capital financing organisation	Networks & associations
Bulgaria	→ Several projects currently being prepared (notably in field of ICT).	→ Business Innovation Centre (IZOT). → IRC Bulgaria hosted by the Applied Research & Communications Fund (ARC Fund). → Bulgarian Industrial Association – includes Intellectual Property Centre.	→ “Encouragement Bank – State bank providing investment credits for SMEs. → United Bulgarian Bank (Guarantee Scheme supported by USAID). → Five venture capital funds operating - Caresbac has lowest investment ceiling. → ProCredit Bank (set up by consortium led by EBRD).	→ National Network for Micro Crediting (DSK Bank). → Bulgarian Association of Regional Development Agencies (BARDA) 18 full members and 15 associate members (RDAs and business centres).
Latvia	→ Latvian Technology Park (Riga Technical University). → Nordic Technology Park (Riga).	→ Latvian Technological Centre http://www.innovation.lv/ltc/eng/ → IRC Latvia. → Latvian Electronic Industry Business Innovation Centre.	→ Baltic Investment Fund, Baltic Post-Privatisation Fund and Baltic Small Equity Fund (cover all three Baltic states). → Norway-Latvia Business Development Fund.	→ Latvian Association of Technology Parks/ Centres and business incubators. → UAC Network – business advisory services. → Academy of Intellectual Property and innovation.
Lithuania	→ Science & Technology Park (Vilnius).	→ Lithuanian Innovation Centre (IRC) http://www.innovation.lt → Kaunas University of Technology Innovation Centre http://www.idc.ktc.lt/en/	→ Baltic Investment Fund, Baltic Post-Privatisation Fund and Baltic Small Equity Fund (cover all three Baltic states). → New mechanism for financing innovation foreseen by government programme.	→ Union of Business Centres including business centres, incubators and technology parks (since 1999).

Malta	→ No technology parks.	→ Malta University Services Ltd. → Institute for Promotion of Small Enterprises (IPSE) → Kordin Business Incubation Centre → IRC being created by MCIST and IPSE.	→ IPSE offers loans guarantee scheme.	→ No networks relevant to innovation.
Romania	→ Technology parks (7 parks are in the development phase under a PHARE 2000 financing programme).	→ Business Innovation Centres [9]. → Regional Centres of Innovation, Implementation and Application of Inventions [3]. → Centres of Innovation and Technology Transfer [13]. → Industrial Liaison Offices (ILO)[12].	→ Equity & venture capital – Black Sea Fund, Danube Fund, Romanian Post-Privatisation Fund. → Government foresees support for risk capital fund.	→ Innovation Relay Centres Network - 6 regional partners based in universities. → Managerial Agency of Scientific, Research, Innovation and Technological Transfer.
Slovakia	→ BIC Bratislava is investigating the creation of a Science & Technology Park.	→ Centre for Advancement of Science & Technology – technology transfer. → 12 Regional Advisory & Information Centres (RAIC). → 5 Business and Innovation Centres (BICs) – 2 are members of EBN. → BIC Bratislava hosts IRC Slovakia.	→ Czech & Slovak Investment Corporations Inc., DBG OstEuropa Holding, GIMV Czech and Slovak SME Fund, Slovak Post-Privatisation Fund. → Government Innovation Fund → Slovak Guarantee Bank.	→ Association of Industrial Research Institutes (20 institutes).
Turkey	→ TUBITAK Marmara Research Center Technological Free Zone → Middle East Technical University Technopolis	→ 12 out of 90 public research institutes carry out industrial R&D. → R&D institutes of TUBITAK: notably Marmara Research Centre (MAM). → R&D/Technology Centres of TTG. → TUBITAK-UME (metrology, prototyping services, etc.). → KOSGEB runs 10 incubators.	→ TTGV supports creation of venture capital funds. → Halk Bankasi – major bank providing credit to SMEs – link to credit guarantee fund. → VakifRisk – local VC company supporting early stage companies.	→ National Productivity Centre; → Union of Chambers of Commerce and Industry. → Istanbul Chamber of Industry. → Quality association of Turkey. → Turkish Industrialists and Business Association.

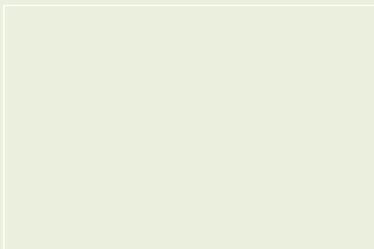
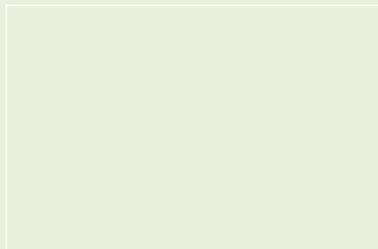
4 CHALLENGES FOR INNOVATION POLICY IN THE CC7

Increasing business innovation intensity to sustain growth rates high enough to narrow the cohesion gap

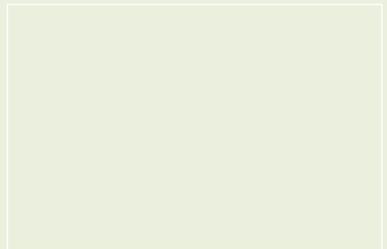
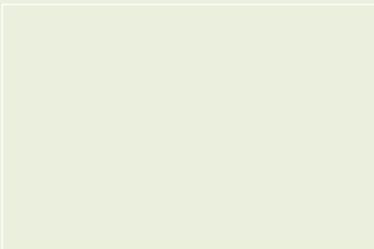
There is an obvious challenge to increase understanding of innovation processes in enterprises. This needs to be pursued rapidly. An important factor in this challenge is that any message must stress persuasively to enterprises that they have a vital role to play and cannot expect Governments to carry all the responsibility; and that investment in people, processes, marketing and organisational change will all be essential element of success.

Policy options

→ The Community Innovation Survey should be carried out in all candidate countries. Foresight type activities should also be encouraged in order to give substance to priorities in favour of technologies or fields of activity.



Government's need to 're-engineer' their policy making and delivery process – fostering first the awareness of the need for innovation, supporting competence building in enterprises and building innovation policies with rather than for the business sector.



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- 2
- 3
- 4

- 1. Wine fair Vinaria, Plovdiv, Bulgaria
- 2. Mazeikiai Oil Company, Lithuania
- 3. Knitwear firm, Ogre, Latvia
- 4. Manufacturer of cosmetics boxes, Zetjun, Malta

Recognising the pervasive nature of innovation as a cross-cutting policy issue

- Stronger emphasis on organisational innovation and on design and marketing of innovative products
- Strengthening the financial systems and meeting the need for equity finance for innovative high-risk firms.

Current understanding of innovation is limited. As a result there is too much concentration on technology issues and a consequent lack of attention paid to other, equally important, aspects of innovation success. It is important to ensure that Governments and enterprises can identify all the elements of policy and management performance which must be addressed and to build a robust framework which will allow them to do so with coherence and certainty.

Policy options

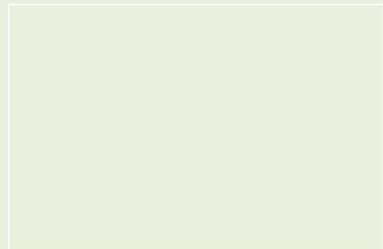
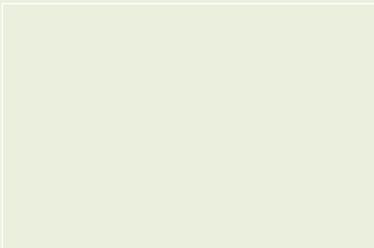
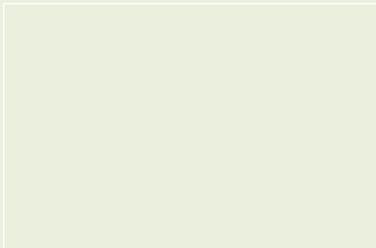
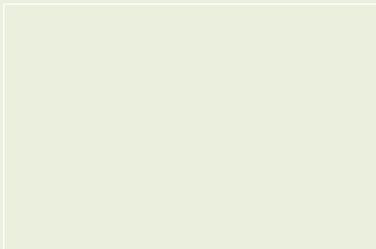
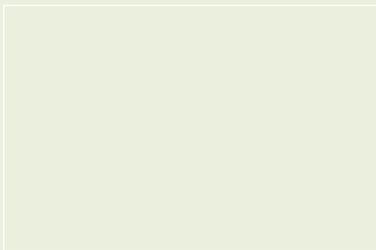
- Creation of innovation advisory committees operating at inter-ministerial level with adequate resources to prepare and issue consultative opinions
- The effective and continued involvement of business representatives in such bodies.
- In-depth examination of the IPR framework and its influence on innovation performance is required.

Mobilising more effectively relative strengths in human resources for innovation

The labour force will be an important element in knowledge creation. Its ability to contribute to that process is currently undermined by inadequate knowledge and training. The challenge is to equip managers and workers with a higher level of skill. These skills must be nurtured through both fundamental education and improved levels of participation in continuous vocational training. This improvement in the skill base must extend to areas beyond science and engineering

Policy options

- Maximising the potential of the relatively favourable human resource qualification structures in the candidate countries
- Providing aid to encourage transfer of knowledge through recruitment or short-term placements of researchers in industry.
- Reinforcing the current ad hoc initiatives to introduce innovation management as a part of core



1. Paneuro auto parts factory, Targu Mures, Romania
2. Volkswagen factory, Bratislava, Slovakia

3. Financial centre buildings, Istanbul, Turkey

Increasing the rate of creation and diffusion of ICT in the economy as a source of value added and productivity

Establishing a set of innovation policy measures reflecting the diversity of innovation processes in enterprises

science/engineering and business/economic curricula in higher education

→ Linking financial support for technology upgrading and equipment acquisition in enterprises with continuous vocational training

ICT is not being used to its full potential. The challenge is to increase the rate of penetration of ICT as a whole and at the same time to see it reach and stimulate innovation in those parts of the economy where it is currently under utilised. As a result of this slow diffusion of ICT productivity still awaits the major boost which its intelligent application can provide.

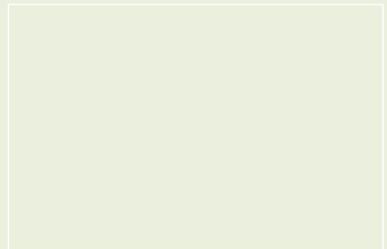
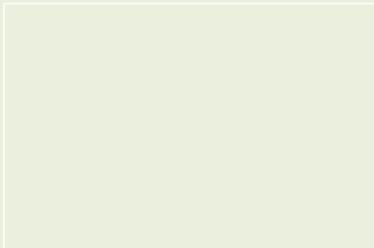
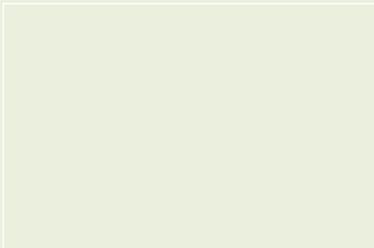
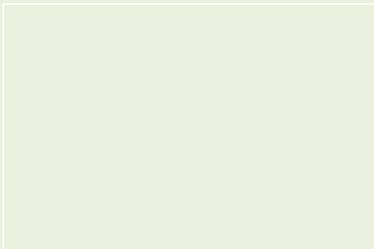
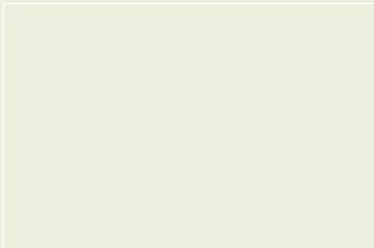
Policy options

- Encouraging a more rapid diffusion of ICT to existing enterprises as a key driver for productivity growth.
- Funding incentives for upgrading existing IT base
- Paying close attention to the human resource and organisational issues related to ICT diffusion.
- Providing consultancy, funding for hiring new IT employees, measures to train and retain specialists in ICT in the economy.
- Setting up targeted research programmes.

This challenge follows on from that of establishing a widely shared consensus around the complex nature of innovation. It will require all policies to be assessed for relevance before implementation; careful and timely evaluation of their impact; and an ability to make adjustments to ensure that the policy objective is met. This in turn sets a challenge to the skills of policy makers and programme managers; to the infrastructural systems which underpin support measures and to the ability of Governments to consult and act upon the views of other partners.

Policy options

- Closing the funding gap by improving the current range of instruments and funding schemes and their take-up by the enterprise sector.



1. Bulgarian Parliament in Sofia, Bulgaria

2. Kaunas, university town, Lithuania

3. Riga School of Arts & Crafts, Latvia

Reinforcing the institutional capability for designing, delivering and evaluating innovation policy

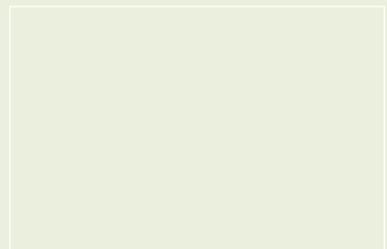
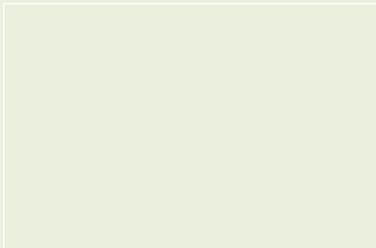
- Building competence in enterprises or in supporting organisations to manage innovation projects.
- Stronger emphasis on funding co-operative sectoral structures involving partnerships of enterprises, research centres and other intermediaries
- Forging links with foreign direct investment firms as a key source of technology and organisational change
- Strengthening Industry-science links in order to create an 'entrepreneurial culture' in higher education and research establishments.
- Creation of interface services to advise academics on IPR management
- Encouraging higher education institutes to examine other more entrepreneurial ways to give greater weight to industrial research co-operation.

Too much policy is being made in a vacuum where the capability of policy makers is weak and the institutional arrangements are uncertain. The challenge is to provide a clear outline of competences and responsibility within each country and a basis for exchanging insight and expertise between countries. With such a framework securely in place effort must then be devoted to enhancing the capability of policy makers and other stakeholders.

Policy options

- Consolidating trans-national learning by the full integration of candidate countries in EU "open policy benchmarking" initiatives on innovation, research and entrepreneurship policies.
- Recognising the importance of motivating and retaining staff in specialised 'innovation policy' services.

- Creating 'agencies' able to act as implementing authorities for Structural Fund actions in favour of innovation.
- Developing evaluation and monitoring capacities
- Reinforcing the capacities of existing innovation intermediaries creating stronger networks.
- Deepening analysis of specific factors affecting innovation capacities in the candidate countries.



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1. Sunday market, Malta

2. Romanian Commercial Bank headquarters, Romania

3. Courtyard of Europe, Komarno, Slovakia

4. Main train station, Istanbul, Turkey

Working papers

- Innovation Policy Profile: Bulgaria, Final Report, January 2003.
- Innovation Policy Profile: Latvia, Final Report, January 2003.
- Innovation Policy Profile: Lithuania, Final Report, January 2003.
- Innovation Policy Profile: Malta, Final Report, January 2003.
- Innovation Policy Profile: Romania, Final Report, January 2003.
- Innovation Policy Profile: Slovak Republic, Final Report, January 2003.
- Innovation Policy Profile: Turkey, Final Report, January 2003.
- Radosevic Slavo and Tomasz Mickiewicz, Innovation Capabilities of the Seven EU Candidate Countries, January 2003.

Useful sources of further information

European Union

- Further information on recent and forthcoming studies in Innovation Policy Series, including the previous report on Innovation Policy in Six Candidate Countries, can be found at: <http://www.cordis.lu/innovation-policy/studies/>
- Recent publications and news about developments in the field of Enterprise policy can be found on the web site of DG Enterprise: http://www.europa.eu.int/comm/enterprise/index_en.htm
- All Regular Reports on Progress to Accession and other up to date information on the accession negotiations can be found on the web site of DG Enlargement: <http://www.europa.eu.int/comm/enlargement/>
- Publications and regular updates on statistics for both the European Union Member States and Candidate Countries are available from Eurostat: <http://europa.eu.int/comm/eurostat>

National government web sites

Bulgaria: <http://www.government.bg>

Latvia: <http://www.am.gov.lv/en/>

Lithuania: <http://www.lrvk.lt>

Malta: <http://www.gov.mt>

Romania: <http://www.gov.ro>

Slovakia: <http://www.government.gov.sk>

Turkey: <http://www.mfa.gov.tr>

Selected enterprise support or innovation related organisations in the CC7

Bulgarian Agency for Small and Medium-Sized Enterprises: <http://www.asme.bg/en/default.htm>

Latvian Innovation Support Structures: <http://www.innovation.lv>

Lithuania: Lithuanian Development Agency: <http://www.svv.lt/index.php>

Malta - Institute for the Promotion of Small Enterprise: <http://www.ipse.org.mt/>

Romania: The National Council of Small and Medium Sized Private Enterprises (CNIPMMR): <http://www.sme.ro/en/>

Slovakia: BIC Bratislava: <http://www.bic.sk/about.shtml>

Turkey: TTGV: http://www.ttg.gov.tr/eng/eng_main.html

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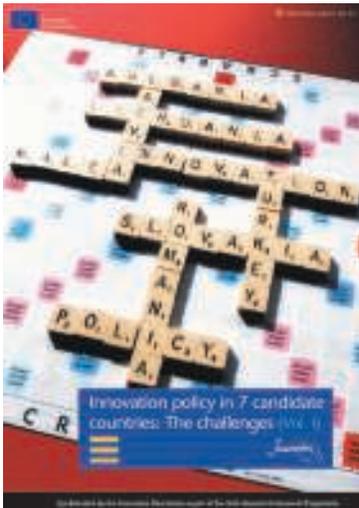
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The full synthesis report, the seven country reports and a working paper analysing innovation data for the candidate countries have been published by the European Commission and can be requested from the innovation helpdesk:

innovation@cec.eu.int

The reports can also be downloaded in PDF format from:

http://www.cordis.lu/innovation-policy/studies/geo_study3.htm

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http://europa.eu.int/comm/enlargement/picture_candidate.htm

