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TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN
ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE
REGIONS**

Innovation policy: updating the Union's approach in the context of the Lisbon strategy

EXECUTIVE SUMMARY

Innovation is a cornerstone of the “Lisbon strategy” launched by the European Council in March 2000, and emphasised by subsequent European Councils, in particular at Barcelona in 2002.

The present Communication on innovation policy, together with the Communication on industrial policy in an enlarged Europe and the Green Paper on entrepreneurship, form a coherent framework for the development of an enterprise policy that fosters competitiveness of companies and contributes to the growth of Europe’s economy.

It also constitutes a timely contribution to the Spring European Council to be held on 20-21 March 2003.

While recognising that research is a major contributor to innovation, and the importance of the recent Communication “More research for Europe, towards 3% of GDP”, the Communication highlights that there are many other forms of innovation.

Innovation can be incremental or radical, it can result from technology transfer or through the development of new business concepts, it can be technological, organisational or presentational.

The object of the Communication is firstly to describe the diverse routes to innovation and analyse the consequences for the design of innovation policy and for the different means by which innovation policy is put into action, so that they are not hampered by a view of innovation which is too restrictive.

This analysis is complemented by examination of the current challenges that are, to different degrees, specific to the EU, recognising that structures, problems and opportunities relating to innovation are not necessarily the same in all the world’s major economic areas. Factors considered include the persistently inadequate performance of the Union, the implications of enlargement, demographic trends, and the large size of the public sector in EU economies.

While innovation policy takes place mostly at the national and regional levels, the Member States and the Commission need to intensify their cooperation for the strengthening of innovation in the EU, including coordination and assessment mechanisms for mutual learning, as well as for taking stock of progress achieved. The Communication makes concrete proposals on how to turn European diversity into a strength.

The Communication also suggests several new directions for EU innovation policy development and, in particular, interaction with other policy areas. Innovation policy must often be implemented via other policies, and the Communication suggests, *inter alia*, better coordination and a pro-active follow-up by the Commission and Member States.

The conclusion provides a summary of the main measures proposed to be executed by the Member States, the Commission and in cooperation between both.

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1. INTRODUCTION

Achieving an innovation performance that makes the European Union a world reference for innovation represents an enormous opportunity that can translate into raised living standards over the coming years. Progress towards such a more innovative European economy is however proving tentative and fragile.

Enhancing innovation is a cornerstone of the strategy to meet the target agreed by the European Council in Lisbon in March 2000 of the Union becoming the most competitive and dynamic knowledge-based economy by the end of the decade. Yet the Commission's 2003 Spring Report¹, which assesses progress towards the Lisbon goal, stresses that much remains to be done, particularly in the area of knowledge and innovation signalled as the central priority for the coming year in taking the Lisbon strategy forward.

This finding is also reflected in the Commission's 2002 innovation scoreboard², which shows that the innovation performance of the Union remains low in comparison with the United States and Japan.

Insufficient innovative activity has already been cited by the Commission as a key factor behind Europe's underperformance in productivity growth³. The positive trends revealed by the scoreboard are welcome but not sufficient to allow us to be confident of attaining the Lisbon target within the planned timetable.

A similar picture emerges from the Global Competitiveness Report⁴. With a wider coverage of non-European countries than the scoreboard, it shows most EU Member States outpaced in innovation performance by several countries in addition to the United States and Japan.

With three years already passed of the ten set by the Lisbon timetable, the Union must review its attitudes and approaches to innovation.

R&D is an essential factor for long-term growth and European prosperity. The Union's relatively low expenditure on R&D explains part of Europe's innovation weakness, and has recently been addressed by the Communication *More research for Europe. Towards 3% of GDP*⁵.

Important though research is as the source of invention, innovation encompasses more than the successful application of research results. The evolution of the innovation concept - from the linear model having R&D as the starting point to the systemic model in which innovation arises from complex interactions between individuals, organisations and their operating environment - demonstrates that innovation policies must extend their focus beyond the link with research.

¹ COM(2003) 5

² SEC(2002) 1349. The European innovation scoreboard has been published annually by the Commission since the Lisbon European Council.

³ *Productivity: The Key to Competitiveness of European Economies and Enterprises*, COM(2002) 262

⁴ *Global Competitiveness Report 2002-2003*, World Economic Forum

⁵ COM(2002) 499. See also *The 2002 Broad Economic Policy Guidelines*, European Economy No 4, Office for Official Publications of the EC, 2002

The design of public policy to encourage and support a larger, more effective and more successful population of innovative enterprises, including SMEs, is at present based on a perception of innovation that remains rather narrow.

The Union must recognise the full scope of the innovation phenomenon. In order to identify whether, and how, public policy should address weaknesses in the innovation system in Europe it must develop a better understanding of the mechanisms of innovation in the European context.

The Union must ask questions such as why progress in matching the innovation performance of the world leaders is proving so slow, are European framework conditions hindering the conversion of skills and knowledge into innovation, and is the process of innovation in the European context properly understood. It must investigate whether there are actions that could be taken at European level that would have a major leverage effect on the Union's innovation performance. It must identify effective responses, and implement them.

This Communication initiates such an assessment, as a start to the process of updating the basis for European innovation policy and giving a new impetus to the drive for innovation to help realise the Lisbon objectives. This must be founded on a renewed political willingness by Member States to tackle the obstacles to a more innovative Europe, a willingness which Member States recently showed in reaching a common political approach on the Community patent at the Competitiveness Council of 3 March 2003.

2. UPDATING THE CONCEPT OF INNOVATION: THE MULTIDIMENSIONAL NATURE OF THE INNOVATION PHENOMENON AND THE IMPLICATIONS FOR POLICY⁶

A concise definition of innovation is “the successful production, assimilation and exploitation of novelty in the economic and social spheres”⁷.

Since it is through enterprises that the economic benefit of the successful exploitation of novelty is captured, the enterprise is at the heart of the innovation process. Innovation policy must have its ultimate effect on enterprises: their behaviour, capabilities, and operating environment.

2.1. The diverse routes to innovation

Enterprises are spurred to innovate by pressures and challenges, notably competition and the desire to create new market space.

The novelty that is essential to innovation may arise in several ways.

⁶ Some of the issues examined in this and subsequent sections are considered in more detail in the Commission publication *Future directions of innovation policy in Europe. Proceedings of the Innovation Policy Workshop held in Brussels on 11 July 2002*, Innovation papers No 31, 2003

⁷ See COM(1995) 688, which also presents a more detailed definition: “innovation is the renewal and enlargement of the range of products and services and the associated markets; the establishment of new methods of production, supply and distribution; the introduction of changes in management, work organization, and the working conditions and skills of the workforce.” These definitions continue to be a valid basis for our approach to innovation policy, and are consistent with the Lisbon European Council's perception of the importance of innovation to competitiveness.

- It may be in the form of an invention. Exploitation of invention arising out of the research laboratory is an important, and much studied, route to innovation. Research is a major contributor to innovation, generating a flow of technical ideas and continually renewing the pool of technical skills.
- An enterprise may innovate by taking an idea from another business sector and adapting it for use in its own production processes or market. Examples are the use in the automobile industry of high performance materials originally developed for aerospace applications, or the spread of computer-aided design into the textile and garment industries. Innovation may proceed as a series of small steps - *incremental innovation* – as enterprises find ways to update their products and processes. Entrepreneurs are impelled to innovate as a means to react to an innovative competitor, using their creativity to attempt to outdo the competition.
- The search for new, untapped, market space is another driving force. This may rely on technological innovation, or on reconfiguring existing products and services so as to present a radical change that will be perceived by customers as offering more or better value (“value innovation”). The “reinvention” of the wristwatch as a low-cost fashion accessory is an example of this form of innovation that was not technologically demanding.
- It may be through introduction of a comprehensively new approach to a business, such as the new business models of on-line retailers, with the objective of creating new market space, or increasing profitability in an existing market.

Competition through innovation appears to be as important as price competition as a reaction by enterprises to market pressures. In many business sectors, an enterprise that allows itself to lag behind in the race to generate new or improved goods and services, and better ways to produce or run them, is putting its future on the line. In such fast-moving sectors it is the new enterprises with growth potential that are often the most innovative, forcing established enterprises to respond to the challenge by themselves becoming more innovative. Encouraging the emergence of new firms is a strong force for innovation in many sectors.

While research is a major contributor to innovation, if there is no entrepreneurial action there is no value creation. It is the enterprise that organises the creation of value. With the shortening of product cycles, enterprises face the need for more capital-intensive investment and must put more emphasis on the ability to react quickly. For enterprises, innovation is a crucial means to create competitive advantage and superior customer value. Except for certain types of technology-based enterprises, the focus is not on technological aspects of new product development, but on innovative ways to improve their position in the market.

Thus, in addition to the term *technological innovation*, covering innovation derived from research, further classifications may be identified. *Organisational innovation* reflects the recognition that new ways of organising work in areas such as workforce management (such as positive action to involve all employees in order to make work organisation a collective resource for innovation), distribution, finance, manufacturing, etc can have a positive influence on competitiveness. This term may also include *business model innovation*. *Presentational innovation* is beginning to be

used as a comprehensive term to cover innovation in areas such as design and marketing.

The speed and efficiency of the diffusion of innovation through the economy is critical to productivity and economic growth. It can be pictured as a cascade process. Through the forces of competition and imitation, an initial innovation is developed and improved so that the impact on the economy is many times greater than that brought about by the first application of the innovation. The process requires the constant reallocation of resources to activities that lead to more efficiency or greater economic value, so that the occupational and geographical mobility of the workforce is an important factor for innovation.

Leaders in technology development are not necessarily leaders in technology adoption. The most important economic contribution does not necessarily come from the “early adopter” but from the “fast follower” who adopts the innovative design that captures the international market.

2.2. Implications for policy

These considerations demonstrate the diversity of innovation and the resulting difficulty in modelling the processes by which innovation happens.

Descriptions of the innovation process – firstly linear models, later evolving into the current systemic view – position R&D as either the initiating or decisive factor. Although it is the systemic model that now dominates in policy discussions⁸, many measures put into practice with the intention to promote innovation still appear to owe more to the linear view.

These models help us understand the special case of technological innovation, and justify concern over the relatively low expenditure on R&D in the Union⁹. Furthermore, the progression to the systemic view marks a growing appreciation of the many factors and linkages influencing the innovation process. But the systemic model has yet to be fully reflected in the way that innovation policy is devised and implemented, and has to be developed so as to offer an understanding of other forms of innovation to complement our knowledge of technological innovation.

These models also colour measurements of the innovation process and innovation performance, which are usually biased towards indicators of technological innovation. Capacities and performance in non-technological forms of innovation, and market factors, are at present less well captured by innovation statistics, and less subject to analysis, than innovation linked to research. This may partly explain why some countries’ data showing excellent innovation performance are not matched by equally visible evidence of strong economic growth.

It is eminently conceivable that weaknesses in organisational, presentational, value-added and business model innovation are as relevant to the slow pace of progress towards the Lisbon goals as is the evidently low level of R&D spending.

⁸ *Managing national innovation systems*, OECD, 1999

⁹ See the Commission’s Communication *More research for Europe. Towards 3% of GDP*, COM(2002) 499.

Enterprises must become better at adapting to and taking advantage of change, regularly renewing and redirecting their activities, and showing a stronger entrepreneurial orientation.

The Union must recognise the full scope of the innovation phenomenon and develop a better knowledge of how it works in the European environment in order to put public policy on a firm foundation.

3. THE FIELD OF ACTION OF INNOVATION POLICY

As the motive force for innovation, the enterprise operates amid an array of influencing factors subject to manipulation, to varying degrees, by public policy.

- Innovation is founded on the enterprise's ability to recognise market opportunities, its internal capabilities to respond innovatively, and its knowledge base.

There must be a strong entrepreneurial orientation among management and staff if enterprises are to show this kind of dynamic capability. Policy should help to promote entrepreneurial behaviour, for example by pointing to role models and by offering specific forms of training.

Entrepreneurship is first and foremost a mindset, as pointed out in the Commission's Green Paper *Entrepreneurship in Europe*¹⁰ in discussing policy options for boosting European levels of entrepreneurship. The vast majority of new businesses set up by entrepreneurs are however very similar to already existing businesses: no novelty is created¹¹. For entrepreneurship to contribute to competitiveness, by creating firms that grow and provide more quality jobs, a special highly-developed form of entrepreneurial drive must be encouraged.

- Closely linked is the enterprise's immediate operating environment, providing a set of interactions with other enterprises, organisations and public bodies that are essential for innovation. Factors such as the shortening of product life cycles and the combination of several technologies within a single product or service mean that the innovating enterprise increasingly depends on external inputs, in the form of skills, advice, proprietary technologies, cooperation networks, etc. Considerations of this nature are behind the growing importance of policies in support of clusters – geographic concentrations of complementary, interdependent, yet competing enterprises, their suppliers, service providers and associated institutions (see Chapter 6.4).
- Market demand, market conditions and customer attitudes are strong influences on the innovation behaviour of enterprises
- Framework conditions govern the overall environment which enterprises operate in, affecting their propensity to innovate. Innovation requires highly competitive markets, well functioning capital markets (including venture

¹⁰ COM(2003) 27

¹¹ *Global Entrepreneurship Monitor, 2002 Summary Report*. 93% of entrepreneurs consider their business to be a replication of existing business activity.

capital), a supportive regulatory environment, and flexible, mobile and skilled human resources.

- The knowledge base, as the source of solutions to problems that the enterprise cannot resolve from its internal resources, is a critical aspect of the framework conditions.
- So are education and training, contributing to attitudes to innovation and providing the skills required by the innovative enterprise. The knowledge and learning capacities of people are instrumental for innovation processes, as are their powers of creativity, initiative and drive, determining to a large extent the innovation capability of organisations.

A recent Innobarometer survey presents the views of business managers on the current environment for innovative enterprises (see Annex 1).

There are three main “dimensions” to the policies impacting on these components of the innovation terrain. They also figure as factors to be taken into consideration in the debate on industrial policy in an enlarged Europe¹². Policies to foster innovation and entrepreneurship share common ground with industrial policy and, if successful, generate the constant renewal that enables industry to outperform in growth and competitiveness.

Firstly, the “policy governance” dimension: policy influencing the innovation capabilities and behaviour of enterprises may be set at local, regional, national, EU or even global level. Coherence and complementarity between the different levels is clearly essential.

Secondly, the sectoral dimension: many factors affecting innovation are common to all industrial sectors, although their relative weight will differ according to the characteristics of each sector. Some sectors, however, such as information and communication technologies, the textile industry and biotechnology, have highly specific characteristics and therefore face specific issues that may require a policy response.

Thirdly, interaction with other policy areas: innovation policy must often be implemented via other policies, to take account of the diversity of factors influencing innovation by enterprises. Innovation concepts must be increasingly embedded in many policy areas¹³.

These multiple dimensions confirm the ubiquitous nature of innovation policy. This characteristic is the main obstacle to effective policy – because innovation is everywhere, it is nowhere. Public administrations often show too much conservatism in their processes for innovation policy development, by rigid adherence to orthodox definitions of departmental “territory”. Dealing with a policy without a well-defined “territory” or an administrative home is a major challenge.

¹² COM(2002) 714

¹³ Examples are presented under point 6.1

The Union must seek to build on this multidimensional framework of innovation policy and, on this basis, define clear objectives and priorities that will have a positive leverage effect on innovation performance throughout the Union.

4. CURRENT CHALLENGES FOR EU INNOVATION POLICY

The scope of the innovation phenomenon and the ubiquitous nature of innovation policy are not the only challenges faced by European innovation policy. The economic, social and political context poses equally significant challenges for policy makers. The Union's structures, problems and opportunities relating to innovation are not necessarily the same as those encountered in other major economic areas of the world.

4.1. Inadequate performance

The dominant challenge is the inadequate innovation performance of the Union as a whole.

Many states that compete strongly with the Union in global markets are implementing strategies to boost innovation that have much in common with the Lisbon strategy. The EU will have to work hard just to retain its present relative position. To attain the Lisbon goal of being the most competitive requires us to step up a gear.

Above all, the resistance to structural change that is frequently encountered in Europe must be overcome when it stands as an obstacle to innovation, especially when change is resisted merely because it challenges existing procedures that people have become accustomed to¹⁴.

The innovation performance of Member States, Candidate Countries and certain other European States, and of the Union as a whole, is measured by the Commission's European innovation scoreboard. It demonstrates the weaknesses in the Union's position relative to the United States and Japan.

There are nonetheless some encouraging features of Europe's innovation profile. Both the 2001 and 2002 scoreboards^{15,16} show that for many innovation indicators the leading countries of the Union are ahead of the United States and Japan¹⁷. Both scoreboards also demonstrate the wide variety of innovation performance in the Union, and possible diverging trends between Member States for some innovation indicators. These considerations highlight the potential for exchange of good practice

¹⁴ See the Commission's Spring Report 2003 (COM(2003) 5) which identifies key priorities for the next twelve months within the decade-long Lisbon strategy. Many of these focus on completing the process of structural reforms of labour, capital, goods and service markets and improving the regulatory climate for business.

¹⁵ SEC(2002) 1349

¹⁶ SEC(2001) 1414

¹⁷ It must be borne in mind, however, that the European innovation scoreboard focuses on high technology innovation. Although it includes indicators for the diffusion of innovation, these are not fully adequate to capture innovation through the purchase of advanced manufacturing technology or the development of new methods of production and delivery, as occurs in sectors characterised as "low" or "medium-low" technology (see SEC(2002) 1349). A further challenge for the Union, therefore, is to develop an innovation scoreboard with a more satisfactory coverage of innovation in all its forms.

and experience within the Union using the “open coordination method” defined at the Lisbon European Council, and the challenge of capitalising on this potential.

4.2. Enlargement

Enlargement will significantly change the Union’s innovation profile. The available evidence points to strong disparities in the innovation frameworks and performance of Candidate Countries compared to Member States. On the one hand, people and companies in the Candidate Countries have shown a remarkable capacity to transform their economies. This also reflects a taste for innovation which will be beneficial for the enlarging EU. On the other hand, the existing obstacles to innovation in Candidate Countries must be directly addressed to raise the performance of the enlarged Union, making a further challenge to the open coordination method.

Many of the challenges faced by the Candidate Countries are similar to those in Member States, although often more acute: risk aversion, under-investment in R&D, limited research-industry cooperation, etc. Others are more specific to the Candidate Countries. The legacies of centrally-planned economies have left their mark, not only on their economic but also on their institutional, educational and social frameworks. The absence of fully-fledged innovation policies, lack of coordination between policy areas having a bearing on innovation, limited human and financial resources for implementation of innovation initiatives, as well as weak financial systems and limited capacity among firms for absorption and application of knowledge and for networking, all constitute significant challenges to a strengthening of innovation capacity and will need proper policy responses by the EU¹⁸.

Necessity entrepreneurship – a term that describes those who start a business because they cannot find alternative forms of employment – is rare in several Member States but may play a more important role in Candidate Countries. It is important to note that many who are forced to become necessity entrepreneurs are well-informed and creative, and they include entrepreneurs creating new markets.

Innovation requires that entrepreneurship be encouraged in Member States and Candidate Countries, by policies that take into account the different patterns of entrepreneurship that are pertinent in different countries and regions.

4.3. Skills shortages

Real wealth – in terms of economic performance, industrial competitiveness and employment – comes not from the production of material goods alone, but from the production, transformation and exploitation of knowledge. Especially in the context of the increasing role played by the service sector in economic activity, knowledge is of fundamental and strategic importance for innovation.

The skills of their staff are fundamental to enterprises’ capacity to obtain knowledge and to use it to innovate. Shortages arise within the Union of certain specific skills relevant to the innovation process. Examples are to be found in the periodically recurring mismatches between labour supply and demand for specialist skills in

¹⁸ See Innovation Papers No 16, and further papers to be published in this series, on innovation policy issues in Candidate Countries

information and communication technologies, or, among venture capital operators, for the ever-changing specific skills needed to assess and manage investments in innovative enterprises in new technological fields.

Innovation also requires the widespread acquisition of more general skills. Entrepreneurship skills must become more common than at present, as must the skills to thrive in new and changing work situations.

Demographic trends in Europe mean that enterprises will tend to have proportionally more older staff. In most Member States, the working age population (15-64 years) will stop increasing before 2012.

This trend will have to be taken into account in work organisation and in human resources policies. The organisation of work must provide opportunities adapted to the last phase of working life encompassing flexible working time arrangements and participation in training, for example. Methods will have to be addressed to continually update skills and knowledge and to ensure good cooperation between staff of different ages, drawing the benefits of the skills of the various generations. Social partners at all levels should work towards a framework which facilitates the modernisation of work organisation in a way which contributes to developing the skills of all age groups and to prolonging the contribution of older workers to economic activity.

4.4. Specific features of the Union's economic and social setting

Several further specific features of the European Union have an important bearing on innovation policy development, for instance:

- The large size of the public sector in Member State economies means it should be heavily involved in the campaign to boost innovation. As a major user of products and services that enterprises provide, the public sector is in a strong position to encourage innovation among enterprises.

Public authorities, as providers of advisory and support services, and as implementers of regulatory and administrative rules, have many interfaces with innovating enterprises. Well-designed services, operated in an efficient manner, contribute to a good climate for innovation, as does timely and efficient implementation of rules.

- Most Europeans live in metropolitan areas. In regenerating our cities, we should build on their capacities in the provision of knowledge, skills, a highly qualified work force and geographical links to turn them into foci of innovation. Cities aspiring to become centres for innovation must make themselves attractive not only to companies but also to talented individuals¹⁹. This means welcoming innovative newcomers, including foreign-born workers who often bring in new ideas and a new spirit of enterprise. Plenty of jobs must be available: many talented people will not move to a new city without reasonable assurance of finding another job there when the first job ends or

¹⁹ *Competing in the Age of Talent: Quality of Place and the New Economy*. R. Florida. A report prepared for the R.K.Mellon Foundation, Heinz Endowments, and Sustainable Pittsburgh, 2000

when they want to move on. Cities must also offer a variety of lifestyles to attract and retain innovative talent.

- European diversity brings with it different aspirations and attitudes to innovation that have to be respected. Attitudes are especially likely to be nuanced when innovative developments have a social impact. The full and genuine participation of all stakeholders in the innovation process, including the public at large, needs to be ensured.

In brief, the challenge is to develop a specifically European approach to innovation policy that will constitute a path to improved economic growth.

5. A COORDINATED FRAMEWORK FOR INNOVATION POLICY IN THE EU CONTEXT

Through the specific innovation promoting programmes of successive EU research framework programmes, notable progress has been made in linking national innovation systems. European-level networking of key players in the innovation process is in place, and services are offered to further transnational technology transfer. A mutual learning process for policy makers, and the information collection and analysis that it relies on, has been set up. These activities, summarised in Annex 2, continue under the current Sixth Framework Programme (2002-2006).

It also goes a step further than previous research framework programmes in placing squarely on the beneficiaries of research funding the responsibility to generate innovation from their EU-funded activities. This obligation is especially clear and strong in the case of integrated projects, and research to boost the technological capacities of SMEs.

The substantial progress in managing the link between research and innovation, and integrating innovation promotion in EU research policy, should be complemented by examination of other policy interfaces at EU level relevant to the climate for innovation by enterprises.

The Commission's 2000 Communication *Innovation in a knowledge-driven economy*²⁰ identified five priorities to steer Member State and EU-level actions to promote innovation: (1) Coherence of innovation policies, (2) A regulatory framework conducive to innovation, (3) Encourage the creation and growth of innovative enterprises, (4) Improve key interfaces in the innovation system, and (5) A society open to innovation. An account of the follow-up of this Communication by Member States is published in the report *Innovation policy in Europe, 2002*²¹.

These priorities continue to be valid today. The preceding analysis demonstrates, however, that a further enhancement of our efforts to encourage innovation is required. This should take account of the broad scope of the innovation phenomenon, the diversity of public policies that have an influence, or have the potential for influence, on innovation performance, and the specific nature of the European context.

²⁰ COM(2000) 567

²¹ Innovation papers No 29, European Commission, 2003

Member States and the EU institutions must respond. The main elements of a coordinated framework are as follows.

- Member States must build and strengthen their national innovation strategies, adopting an approach that is well coordinated across all government departments with areas of responsibility having a bearing on the conditions for innovation. Coordination should take place at a high political level, to ensure the maximum commitment from the departments involved, and will require administrative support from a “light” central structure.

In Finland, for example, the Science and Technology Policy Council is responsible for the strategic development and coordination of science and technology policy as well as of the national innovation system as a whole. Chaired by the Prime Minister, it comprises seven other ministers and ten members representing stakeholders in innovation. Another example of such an “innovation council” structure is in Portugal, where the government has set up PROINOV, the Integrated Programme for Innovation, with a coordination structure involving five ministries dealing with policies related to innovation under the chairmanship of the Prime Minister.

- Systemic policy-making is also the main challenge at EU level. In the Council of the EU, in 2002 the former Internal Market, Industry and Research Councils were merged into a new Council configuration called the Competitiveness Council. This important development offers scope, yet to be fully explored and exploited, for better integration of research, innovation and competition policy. Within the Commission there are regular meetings of the Group of Commissioners on Growth, Competitiveness, Employment and Sustainable Development, offering even broader scope for a systemic basis to design of innovation policy.
- EU institutions and Member States must together ensure that mechanisms are in place for “vertical” coordination, so that policies interlock at EU, national and regional levels. Member State prerogatives in building their own national innovation systems must be preserved. A common framework for overall coordination and coherence must however be present with the objective of assisting national systems in extracting the maximum possible benefit from the European dimension. It must also work to reduce the innovation divide within the Union, including within the context of enlargement, at the same time contributing to a major improvement in the performance of the Union as a whole.
- Efforts at Member State and EU-level must be supported by upgrading of knowledge on innovation, innovation systems and innovation performance, through improved statistics on innovation and through analysis. For example, data collection and analysis should take account of the different routes to innovation and the importance of diffusion. Member States should consider setting targets for some indicators as a means to help mark progress towards achievement of specific national objectives.

National statistical offices should be encouraged in their efforts in collecting and providing comparable statistical data in the area of innovation. The Commission will increase the coherence of the various ongoing policy

benchmarking exercises that fall under the competence of the Competitiveness Council (European innovation scoreboard, enterprise scoreboard, science and technology key figures). Improved innovation statistics also have to be coherent with international standards in order to allow meaningful comparisons with other major economic areas in the world.

This work should lead to a better understanding of the main factors influencing the performance of national innovation systems in Europe, and identification of actions with a major leverage effect on these factors that could appropriately be put in hand at European level.

This framework must be backed by a number of supporting measures:

- Existing processes enabling Member States to learn from each other's experience in innovation policy development and implementation will be strengthened. An improved framework for the mutual learning process will be built on the existing European forum for benchmarking and exchange of good practice in innovation policy²², and on the Group of Senior Officials from Member and Associate States that assists the Commission in these activities.
- Within this mutual learning process, a pilot initiative will be launched to facilitate smooth convergence towards excellence in the design and implementation of programmes, schemes and specialised support agencies for the promotion of innovation.

The pilot initiative will offer support for independent evaluations, on a voluntary basis, of such programmes, schemes and agencies with a view to identification of the most effective methodologies for innovation promotion among the many public-supported measures in place within Member States.

- Also included will be the establishment of a platform for exchange of information and experience specifically focused on the innovation profile of Candidate Countries, to support them in rapidly developing their frameworks for innovation.

6. NEW DIRECTIONS FOR EUROPEAN INNOVATION POLICY DEVELOPMENT

To complement this overall framework, several new directions should be addressed as routes towards improved innovation performance.

6.1. Interaction with other policy areas to improve the environment for innovative enterprises

The means to take the innovation imperative into account in other Community policies will be further developed. Building on analysis to establish a better understanding of the interfaces with, for example, competition, trade, employment, regional and environmental policies, the objective is to systematically consider and

²² This framework, the *Trend Chart on Innovation in Europe*, includes the collection, updating, analysis and dissemination of innovation policies and performance at national and EU level. One component is the annual *European Innovation Scoreboard*.

take account of the potential impact on Europe's innovation performance of legislative and policy initiatives.

Awareness and understanding of the relationships that come into play at the various policy interfaces is essential. As examples of the diversity of issues that will need to be considered:

- Competition policy is clearly important since competition is one of the main drivers of innovation. From the perspective of innovation policy it is important to distinguish the different forms competition can take. Innovative products, for example, are more likely to arise where there is sophisticated consumer demand than to be the fruit of competition merely on price. The effects of competition and cooperation on innovation are increasingly being recognised. Enterprises that are effective innovators are often those that participate in networks with other organisations. The interaction between competition and innovation policy should aim at encouraging the flow of new knowledge, recognising that some agreements between enterprises may be in the interest of promoting innovation and ultimately lead to greater competition²³.
- Another key interface exists with the Internal Market policy: a well functioning Internal Market, without barriers to trading across borders, encourages competition in goods, services, capital and the mobility of people. This increased competition in turn promotes innovation in all its dimensions, both in the private and public sector, regarding aspects as diverse as advertising, industrial organisation and management, training, customer services, etc.
- Regional policy is an important route for encouraging innovation. The European Regional Development Fund contributes to innovation by funding many innovative activities or projects indirectly supporting innovative activities. Strengthening of the regional dimension of innovation policy is examined further in section 6.4.
- The development of an innovative enterprise culture and competitive nations depends crucially on taxation policies that create an environment favourable to investment, innovation, business development and employment. Taxation policies that contribute to achievement of these aims need to be studied and replicated where possible.

Enterprises may be encouraged to innovate by offering them, in conformity with competition rules, tax relief on expenditure on innovation. In comparison with direct financial support for innovation, the important characteristic of fiscal incentives is that the business sectors and geographic areas that benefit are in effect decided by market forces, since it is enterprises themselves who opt to make the expenditure that qualifies for the tax relief. Direct financial support, on the other hand, is more suited to the targeting by government of specific sectors and objectives. Often both methods will be used, the precise mix depending on national objectives, conditions and industrial structure.

²³ See, for example, the Block exemption Regulation (EC) No 2659/2000 for R&D agreements (OJ L304 5.12.2000, p.7) and the Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements (OJ C3 6.1.2001, p.3)

So far, fiscal policies in support of innovation concentrate mainly on tax relief for expenditure on R&D. Spain is an interesting exception, where tax incentives apply not only to R&D but also to expenditure on technological innovation. In the Netherlands it is the human resources for R&D which are targeted, by way of tax relief for the wage costs of R&D personnel.

The use of fiscal policy to boost components of national innovation systems in addition to R&D may be further explored. In order to design a cost-effective system of fiscal incentives, it may be necessary to identify the key components which need to be supported and define them in precise and operational terms. Furthermore, more information is required on the effectiveness of fiscal measures, to allow Member States to fine-tune their measures, maximising expected benefits against the cost in terms of foregone tax revenues.

- When tax relief is given selectively it is of course a form of state aid, and one of the tasks under European competition policy is to monitor state aids since the European Community Treaty prohibits aid that distorts intra-Community competition. Certain aid, however, may be allowed, for example if it pursues objectives of common interest without distorting competition to an extent incompatible with that interest. On this basis the Commission has issued guidelines that allow state aid schemes in areas including support for research and development and the provision of risk capital, and block exemption regulations allowing aid for SMEs, and employment and training.

State aid is an example of an area of competition policy where Member States and the Commission must be alert to the scope for measures in support of innovation that are not in contradiction to the open competitive environment that incites enterprises to innovate.

- Rigidities of the labour market continue to be an important barrier to innovation in Europe, making employment policy another area with a strong influence on the capacity for innovation. Some Member States have already shown creativity and success in linking innovation to the creation of jobs. Organisational and shop-floor innovation, aiming at “high trust, high performance workplaces”²⁴ as a means to fully reap the productivity benefits of new technologies, require industrial dialogue built on existing good practice or the development of new methods. Well-functioning labour markets should provide adequate incentives and flexibility for both firms and employees to take advantage of opportunities for innovation.

Improved occupational and geographic mobility help to make the labour market more flexible. The Commission’s Action Plan on Skills and Mobility²⁵ and its reform of the EURES system on the Europe-wide exchange of job vacancies²⁶ are designed to make the European labour markets more accessible and to help tackle skills shortages.

- The capacity of the United States to attract highly competent students, workers and researchers has a direct and positive impact on its innovation potential. The

²⁴ For example, by organising the workforce into self-managed, autonomous work groups.

²⁵ COM(2002) 72

²⁶ Commission Decision 2003/8/EC of 23 December 2002 (OJ L5/16, 10.1.2003)

brain drain that Europe experiences may negatively affect its innovation capacity. The objective set by the Barcelona European Council to make Europe's education and training systems a world quality reference by 2010 addresses this issue among others²⁷.

- Europe is recognised as the global leader in environmental policy. Fulfilling its environmental commitments requires huge innovation efforts. The sustainability challenge creates not only new innovation pressures but also new markets for products and processes. Proactive and innovative environmental policies have been introduced at the national level (leading, for example, to the dynamic growth of wind energy industries in Spain and Germany). As European businesses are increasingly taking responsibility for their environmental impacts, European environmental policy is also gradually moving away from “command and control” to an approach which gives more freedom to innovators (for example, the “integrated product cycle” policy²⁸).
- The use of open standards in different business areas reduces costs, simplifies processes and is a key factor in dissemination of technical, managerial and organisational innovations in areas such as product development, manufacturing, marketing, etc. Innovation may be aided by standards that are performance-based rather than prescriptive, in the environmental sector for example. The interface to standardisation policy must be strengthened in order to address future challenges, such as the dissemination of information and communication technologies in traditional industrial sectors.
- The objective of a Community Patent that is simple, cheap and reliable has proved difficult to attain, but has recently become much closer through the adoption by the Council of a common political approach on the main elements of the Community patent. The advantages are clear: estimated annual savings in processing and administering intellectual property rights of around €0.5 billion, lower litigation costs and simpler enforcement²⁹.

At Union level the new Competitiveness Council configuration and the Group of Commissioners on Growth, Competitiveness, Employment and Sustainable Development are contributing to innovation policies based on systemic principles. These developments must be reinforced by a deeper understanding of policy choices on innovation processes and performance, and by mechanisms to take innovation considerations into account without adding complexity to the policy-development process.

6.2. Stimulate greater market dynamism and exploit the concept of lead markets

The creation of new markets and acceptance of new products by customers are of paramount importance for innovation. The market's impact on innovation will grow

²⁷ The Commission's proposal for an “Erasmus World” programme (COM(2002) 401) is also a step towards making Europe more attractive for students and researchers. So are measures under the “Human Resources and Mobility” heading of the Sixth RTD Framework Programme, including support for the professional reintegration of highly qualified European researchers returning to Europe after a spell working elsewhere.

²⁸ COM(2001) 68

²⁹ COM(2003) 5

in the future, and the majority of managers expect that markets will become more receptive for introducing new products.

In this context a deeper understanding is urgently required of the relevance to innovation of market dynamics, including the emerging concept of “lead markets”³⁰.

There are many cases where the country developing a new technology is not the one that adopts it first. National markets vary in their receptiveness for a given innovation. The price and cost structure of a national market can be encouraging for certain types of innovation. For example, automation technologies develop faster in countries with relatively high labour costs, and energy saving innovations in countries with higher energy prices.

Other factors may contribute to market structure advantages, such as regulations or liability rules.

Understanding the reasons why particular national markets in Europe become lead markets, thereby offering a multitude of opportunities to innovators from all Member States, is important and contributes to the management of European diversity. The main factors for national markets to become lead markets are the following:

- They are in advance of a global trend (in income structure, demographic trend, regulations, liability rules, standards, etc).
- They demonstrate a high degree of openness and therefore are likely to reflect global trends.

European diversity, as manifested by differences in consumer preferences for example, coupled with the size of the Internal Market offer a unique combination to enterprises for the introduction of innovative products and services. It is proposed to further investigate the parameters involved in the formation of lead markets, including examination, together with industrial representatives, of the potential for specific industrial sectors to benefit from European lead markets as a step towards a stronger presence on the international market.

6.3. Promote innovation in the public sector

Administrators in the public sector acknowledge the importance of innovation, but in contributing to an improved environment for innovation they are hampered by a relatively poor awareness of the issues at stake and of the interrelated factors influencing the innovation performance of enterprises.

Furthermore, as many “traditional” policy areas have an influence on the climate shaping the innovation behaviour of firms, public administrations will often be obliged to arbitrate between conflicting interests. A good understanding is required of the innovation process and of the policy trade-offs that may have to be made.

The public sector plays an important role in all European countries. It can be a source of innovation, and is certainly an important consumer of innovative products and

³⁰ See, for example, *Lead Markets. Country-Specific Success Factors of the Global Diffusion of Innovations*, Marian Beise, ZEW Economic Studies, Vol. 14, Heidelberg/New York, 2001

services. Efficient, open and competitive public procurement can be a powerful instrument to push innovation. To develop its role as a source of innovation, the public sector could promote new types of services and the use of e-government, e-health, e-education, etc.³¹

6.4. Strengthen the regional dimension of innovation policy

Measures to improve the climate for enterprises to innovate are increasingly being devised and implemented at regional levels, to take account of regions' specific strengths, weaknesses and ambitions. This trend brings with it the risk that regions design and implement their strategies in isolation, failing to take advantage of experience gained elsewhere and not seizing opportunities to benefit from transregional or transnational networks.

Regional authorities must be sensitised to the increasing importance of regional policies for promoting innovation. When designing and implementing regional innovation policies, regional authorities must fully take into account the distinctiveness and the social and economic characteristics of the region. They must learn from what others are doing, but avoid simple duplication – they must each develop their own specific route to improved innovation capacity, depending on their own unique set of circumstances.

The development of clusters of excellence, when there is a conjunction of factors such as infrastructures, availability of skills and expertise, research and technology centres, and enterprises with innovation potential, is of paramount importance for innovation performance. Where these conditions exist it is important that the innovative capacities are encouraged to develop and create competitiveness at world level.

The Italian “industrial districts” illustrate how regions specialising in specific sectors and dominated by small firms are able to grow rapidly and develop global leadership in their sector³². Industrial districts are characterised by high productivity and specialisation in complementary phases of production, founded on the presence of subcontractors, component suppliers and fierce competition among them. Accumulation of know-how is an important factor behind the lasting competitiveness of such clusters.

A well-known example is the Prato region near Florence, an international leader in the production of yarns for knitwear, and knits and textiles for the garment, upholstery and other industries. This success is complemented by the construction of textile machinery, which is also highly export-oriented.

Italian “industrial districts” demonstrate how global leadership can be achieved by close interaction and sector-specific patterns mixing cooperation with competition (“co-opetition”) among SMEs, and by a type of creativity that absorbs R&D inputs without entirely relying on them.

³¹ See the *eEurope 2005* action plan: COM(2002) 263

³² See, for example, *Les districts italiens. Un modèle de développement local exemplaire*, F. Vidal, *Futuribles* no. 256, September 2000

Centres of learning are also important for their potential to act as nuclei for the formation of clusters, building on spin-offs from academic research and creating “hot spots” for innovation.

The Commission will support the efforts of regional authorities and other regional players in the innovation process in devising and implementing innovation policies that are of good quality and include European-level linkages. Support will be built on existing innovation support networks and other activities targeted at the regional level (such as the network of Innovation Relay Centres and the Forum of Innovation Regions)³³.

7. CONCLUSIONS

The productivity gap between the Union and major economic areas such as the United States may not at present have effects that are generally visible in terms of quality of life. This does not mean that we can afford to postpone addressing this growing challenge, which ultimately reflects a weakness in Europe’s capacity for innovation.

In the long term, European prosperity is at risk if the productivity gap continues to increase. Lagging our major competitors in this respect could reduce the capacity to offer the benefits required by the European social model. A successful innovation policy could help to reduce the gap and contribute to increased national wealth. The resistance to change already cited as an obstacle to innovation must be considered in this light. If innovation activity weakens and falls behind, then changes could be forced, in a less controllable fashion, through lack of resources.

There are trade-offs to be made between the preservation of existing structures and practices, and the penalties of a weak innovation performance. Europe must find its own way to balance conflicting interests and priorities.

The Member States and the Commission should define a common framework, and a set of priorities and objectives, for both European and national innovation policy, respecting the characteristics of national innovation systems and the diversity within the European Union. They should build on the *acquis communautaire* (the Internal Market, the euro, etc) and take account of enlargement of the Union.

The Commission therefore invites the Council to alert Member States to the continuing importance of the innovation issue and the potential contribution of a better understanding of the innovation process in the European context to the performance of all Member States.

³³ The Sixth RTD Framework Programme provides many opportunities to European regions in terms of networking, exchanging good practice and developing new initiatives. As well as measures targeted at the regional level to encourage a more innovation-friendly environment, regional authorities can tap into the new instruments of the Sixth Framework Programme (networks of excellence and integrated projects) and the ERA-NET scheme.

7.1. Summary of actions arising out of the Communication

Member States should commit themselves to:

- build and strengthen their national innovation strategies, define their own sets of policy objectives, set their own targets and have their own sets of indicators compatible with European and international statistics,
- cooperate with the Commission by making information available on innovation policies and performance, produce further data and indicators and stimulate national statistical offices in their efforts in collecting and providing comparable statistical data in the area of innovation,
- participate actively in the mutual learning process initiated by the *Trend Chart on Innovation in Europe* and in analysis of the innovation phenomenon.

The Commission will:

- increase the coherence of the various policy benchmarking exercises falling under the competence of the Competitiveness Council (European innovation scoreboard, enterprise scoreboard, science and technology key figures),
- build an improved framework for the mutual learning process in innovation policy on the basis of the present *Trend Chart on Innovation in Europe*,
- cooperate with Member States in analysis of the innovation process, policies and performances,
- launch a pilot initiative offering independent evaluations (on a voluntary basis) of programmes, schemes and support agencies for the promotion of innovation,
- establish a platform for exchange of information and experience focused on Candidate Countries, to support them in rapidly developing their framework for innovation, and extend the European innovation scoreboard to give the same coverage to Candidate Countries as to the current Member States,
- report, every two years, on progress in strengthening innovation policy at national and EU level,
- contribute to promoting innovation in the public sector by:
 - organising exchanges of experience on the promotion and dissemination of information on innovation in government and public services,
 - promoting training and awareness activities on policies and factors shaping the innovation performance of firms,
 - setting up a web-site to disseminate initiatives and tutorials,
 - promoting dissemination of good practices emanating from the public procurement authorities.

Member States and the Commission must:

- ensure that mechanisms are in place for “vertical” coordination, so that policies in support of innovation interlock at EU, national and regional levels,
- strengthen existing processes, in the framework of the *Trend Chart on Innovation in Europe*, enabling Member States to learn from each other’s experience in innovation policy development and implementation,
- intensify their cooperation and create a common framework for the strengthening of innovation in the EU, including assessment mechanisms taking stock of the progress achieved.

ANNEX 1 INNOBAROMETER 2002

*Innobarometer 2002*³⁴, a survey carried out for the European Commission in September 2002 amongst business leaders in the 15 Member States of the European Union, under the Flash Eurobarometer opinion polling system, reports that:

- Enterprises in the European Union slowly but continuously strengthened their innovation activities from 2001 to 2002: the share of new or renewed products or services introduced within the last two years went up 2 points from the 2001 survey and now accounts on average for 22% of companies' turnover.
- The share of investment channelled into innovation by all companies increased slightly since 2001 and now reaches on average over one quarter of companies' investment. The manufacturing sector stands out with a proportion of 32% of investments devoted on average to innovation. Exporting and “younger” companies are also more active in their investments in innovation.
- Knowledge and competencies of staff are key to innovation performance: managers attribute their strength in innovation in the first place (49%) to the qualification and professionalism of their staff. The priority area for training is at the level of technical training and apprenticeship (45%), followed by commercial training. The time effectively allocated to training, however, varies considerably between countries and enterprises: for about one in four companies, commitment to training is absent or merely symbolic, i.e. none or only 1-2 days per employee per year.
- To access advanced technologies, cooperation between enterprises is becoming more important: business leaders count firstly on active collaboration with their suppliers or customers (59%), then on the purchase of equipment (41%), followed by in-house or contracted-out R&D.
- The creation of new markets and the acceptance of new products by customers increasingly require an open debate about innovation with the public. Most companies seem willing to participate in this debate, but for the majority (48%) such discussions take place internally at the enterprise level.
- The most important unsatisfied need relating to innovation is, for one manager out of three, access to innovative customers and/or markets. The majority of managers expect that markets will become more receptive for introducing innovative products in the coming years.
- European business leaders consider the role of markets that are open to innovative products even more crucial compared to 2001. They expect innovation to benefit in the coming years particularly from both the market dimension of the European Union and its common rules. Highly innovative European firms, which are found most frequently amongst exporting companies, younger enterprises and the industrial sector, already seem well placed to build on this opportunity.

The 2002 Innobarometer underlines the willingness of European managers to strengthen their competitive position through innovation. The qualifications of human resources,

³⁴ To be published

cooperation practices with suppliers and customers and, last but not least, the European dimension of innovative markets play key roles in this process.

ANNEX 2 SUMMARY OF CURRENT EU ACTIVITIES TO PROMOTE INNOVATION

So far, EU activities to promote innovation in Europe have been funded from the Research and Technological Development (RTD) Framework Programmes. They include the observation of innovation policy and performance in Europe, and practical measures to improve the innovation environment.

The following is a summary of current activities. Many of them will be further developed in the Sixth Framework Programme.

- The *Trend Chart on Innovation in Europe*, providing collection, updating, analysis and dissemination of information on innovation policies at national and EU level³⁵. It is also the framework for implementing the “open method of coordination”, as launched at Lisbon, in the area of innovation policy. Thus the Trend Chart spreads good practice in order to help Member States develop their own innovation policies and achieve greater convergence towards the Lisbon goals.

One component is the *European Innovation Scoreboard*, an annual presentation of quantitative data on framework conditions, the science and engineering base, firms’ operational environment, and innovation behaviour within firms.

In operating the Trend Chart, the Commission is assisted by a Group of Senior Officials from Member and Associated States (including Candidate Countries).

- Data on firms’ innovation behaviour is collected by the *Community Innovation Survey*, implemented via Eurostat and national statistical offices³⁶.
- *Studies* analyse specific issues in detail, often in the domain of framework conditions³⁷. A lighter type of survey, the *Innobarometer*, making use of the Eurobarometer opinion polling system, looks at firms’ attitudes to innovation³⁸.
- Several activities operate on firms’ operational environment. Mechanisms to support innovative start-ups and their growth are a main focus of attention, notably by networking economic areas with successful records in this area of entrepreneurship (*PAXIS* initiative³⁹). Networks are also being set up among players in innovation financing, and amongst industrial liaison offices in public research organisations with a view to strengthening public-private links (*Gate2growth* initiative⁴⁰).
- The *Innovating Regions in Europe* network provides a mechanism to share experience in developing innovation strategies, and thus is relevant both to firms’ operational environment and to framework conditions⁴¹.
- The network of *Innovation Relay Centres*, by offering firms a local starting point to help them develop transnational technology cooperation and transfer, assists firms in forming linkages with other firms and organisations⁴².

³⁵ <http://trendchart.cordis.lu/>

³⁶ <http://www.cordis.lu/innovation-smes/src/cis.htm>

³⁷ <http://www.cordis.lu/innovation-policy/studies/home.html>

³⁸ <http://www.cordis.lu/innovation-smes/src/innobarometer.htm>

³⁹ PAXIS: Pilot Action of Excellence on Innovative Start-ups; <http://www.cordis.lu/paxis/>

⁴⁰ <http://www.cordis.lu/finance/home.html>

⁴¹ <http://www.innovating-regions.org/>

⁴² <http://irc.cordis.lu/>

- Also directed towards the firm's proximate environment are *innovation projects*, addressing generic barriers to market-driven innovation⁴³. They emphasise non-technical aspects of the process, generating knowledge that ultimately will have its major applications within firms.
- *CORDIS*, the web-based Community R&D and innovation information service⁴⁴, offers access to the science and engineering base, for example through the recently introduced Technology Marketplace⁴⁵ of business opportunities from EU-sponsored and other research.

Although these activities are part of the RTD Framework Programmes in budgetary terms, their scope goes beyond fostering the emergence of innovation, skills and know-how from the European research effort. In view of the wide span of the innovation phenomenon, approaches in support of innovation must take account of forms of innovation not dependent on research or where research plays only a minor part in bringing about the economic and social benefits of innovation.

⁴³ <http://www.cordis.lu/innovation-smes/src/projects.htm>

⁴⁴ <http://www.cordis.lu/>

⁴⁵ <http://www.cordis.lu/marketplace/>