Research and Innovation in the National Reform Programmes

Opportunities for policy learning and co-operation

Report 1 of the Lisbon Expert Group

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Executive summary

On the context of the report

This intermediate report has been prepared by the "Follow up of the Lisbon strategy" expert group created by the European Commission to assist the Commission services in the analysis and follow-up of the research part of the National Reform Programmes (NRPs). To this end, the group decided to take a broader view and, in line with the approach followed by the majority of Member States to report on research (IG 7) and innovation (IG 8) in an integrated manner, and the evolution of R&D policies, conducted an integrated assessment covering both R&D and innovation. This broad approach was considered necessary for the purposes of this report. Later reports will also be based on the same broad approach, although more emphasis will be put on research policies.

On the relevant issues in the NRPs

The analysis focusing on the R&D and innovation part of NRPs has shown evidence on the following elements:

1. The majority of Member States have, in recent years, already adopted policy frameworks for R&D and innovation preceding the NRPs. Then, the value of NRPs as new policy frameworks strongly depends on the previous situation and the choices made by Member States.
2. Most of the NRPs are much more developed on the definition of broad policy goals, rather than on the diagnosis of the strengths and weaknesses of the research and innovation system and on the operationalisation of these broad goals into more practical objectives and concrete instruments. More specifically, the connection between old and new policies and instruments is essential to get a global picture.
3. The presentation of policy instruments does only seldom refer to the effectiveness of current policy mix and mechanisms to monitor this effectiveness.

The governance of R&D and innovation policies plays a key role in both setting and achieving the Lisbon objectives. The institutionalisation of governance processes – the little that is presented in the NRPs – does not yet reflect a new systems oriented governance approach to R&D and innovation policy. The systems oriented governance approach should be reflected in the NRPs in the form of systemic policy instruments.

The group has identified the following important general points to be incorporated in the updating of NRPs:

1. There is a need for an overall vision and strategy for R&D and innovation policy and a need to derive from them specific policy measures both for research and for innovation.
2. There is a need to set S&T priorities and identify the right balance in using the available resources.
3. There needs to be a real and wide ranging commitment of all stakeholders.
4. The quality of policy implementation (stability, management, evaluation, etc.) needs further attention.

The report considers different aspects of NRPs and identifies main messages and recommendations on improving the R&D and innovation policy governance processes. The aspects considered are the analysis of the Barcelona R&D investment objective

and different policy issues: policy mix, improving financing, regulations and support systems for innovation, ensuring the availability of qualified human resources, reforming the PRO, and enhancing PPP and technology transfer.

On the R&D investments

The most important quantitative objective in the Lisbon Strategy is to raise the level of R&D investment in the EU as a percentage of GDP to approach 3% by 2010, 2/3 of which should be funded by private sources. Member States reacted by incorporating quantitative targets and specific policy measures in their NRPs in the time periods considered (2008 and 2010) although, in some cases, they only partially covered them (i.e. target on public expenditure) or for other periods of time (e.g. 2013 or 2014).

The discussion in the group has clearly shown that setting quantitative objectives of this kind is not straightforward. The relationship between R&D and innovation is not frequently a direct one, and innovation depends on many other inputs and conditions that R&D investments.

It is the opinion of the group that the level of the targets set by some Member States and the probability of reaching them in 2010 can be considered as too ambitious while keeping the credibility in the implementation process. Political ambition should be checked versus actual implementation of concrete measures

Overambitious objectives for R&D and innovation present two major challenges. First of all, R&D and innovation is strongly path dependent. Second, it depends on the trust of the private sector towards the government. Creating the necessary trust to enable networking and clustering between companies in a highly competitive and low trust business culture is likely to take much longer than in a less competitive and more trusting business culture.

There is a danger that quantitative objectives might take the attention away from the need for structural reforms at all levels of the European research and innovation system. What is important is that Member States initiate reforms which have a longer term impact on the competitiveness of Europe. Structural reforms at the public system could be directly driven by legal and administrative reforms led by Governments. However, structural reforms at the private sector are much more difficult. They should be induced by introducing new policy instruments.

On the policy mix

Investing more public funds in R&D does not ensure more innovation. Extensive research on innovation systems over the last decade has revealed clearly that enhancing R&D and innovation requires an appropriate mix from a variety of policy measures targeted at the most important failures of the research and innovation system. This involves typical instruments from the R&D portfolio, but also instruments and conditions from outside the traditional sphere of R&D policy.

Therefore, the effectiveness and efficiency of policies is not determined by individual measures but by the appropriateness of the mix of policies and measures applied in specific national and regional contexts. The report reveals that only few NRPs have made explicit efforts to cope with a system-oriented policy portfolio.

Main recommendations

The report identifies the following recommendations for the future development of NRPs.

1. Member States should seize the opportunity of the NRP process to implement instrumental and structural reforms in their national research and innovation systems by using regional, national and European policies in a coordinated way.
2. Member States should pursue structural mechanisms to involve all stakeholders (national/regional agencies, industry, research performers; etc.) and develop shared strategies to make the NRP's commitments credible. Then, the effort made in the elaboration of the NRPs (strongly constrained by calendar deadlines) should be periodically repeated to update their contents.
3. Member States should explicitly state in their NRPs the overall vision and strategy for R&D and innovation to be pursued according to the Lisbon process and in the evolution of the national research and innovation systems by emphasising internal policy learning.
4. Member States should describe in their NRPs the planned strategy in translating the vision into prioritised policy measures.
5. NRPs should provide a global view of education, research and innovation in policy definition and implementation with clear commitments and responsibilities of all stakeholders affected. From this view progress reports should be improved at national level to address research and innovation policy in a more coherent manner.
6. Member States should consider the strategic value of increased trans-national collaboration and progressive level of co-operation between national research and innovation systems to overcome the fragmentation of European research and innovation policies.
7. Member States and the Commission should stimulate the effective use of policy learning instruments both at national and European level, specifically in the framework of OMC, and other mechanisms at the international level.
8. Mechanisms to assess the effectiveness of policy implementation and impact are needed.

A number of issues emerge from the previous analysis. Together these issues constitute an agenda for further development and improvement of the NRPs and for contributing to better governance.

1. More attention to policy governance
2. More attention to the coherence of European, national and regional policies
3. More attention to measures aimed at enhancing the demand for innovation
4. More attention to the many forms of innovation

Opportunities for policy learning

Finally, the following ideas for future policy learning e.g. in the form of OMC groups or OMC-NETs are identified:

1. **How to streamline and reform R&D and innovation support systems?** Increasing understanding and appreciation of the complex and dynamic characteristics of innovation processes and the attempt to develop targeted policies and measures to address specific market and systemic failures of European, national and regional innovation systems have over time led into rather complex innovation support systems. This complexity is likely to make innovation support systems ineffective and inefficient. While Member States with more developed innovation systems will most likely benefit from sharing experiences in this issue, at the same time other Member States can learn to avoid typical problems.

2. **How to improve the involvement of a wider range of stakeholders in the design and implementation of NRPs?** Governance of European, national and regional R&D and innovation policies is becoming increasingly important. Trust and long term commitment to shared visions and strategies as well as effective and efficient implementation of policies call for governance processes in which all stakeholders can access and contribute. Most Member States have developed some ways of involving stakeholders but are (or should be) still looking for improvements. This presents an opportunity for sharing experiences and mutual learning.
3. **How to assess the leverage effect of R&D and innovation policy measures?** Public funds should enhance private investments in R&D and innovation. However, there is very limited information available on the true leverage effect of various policy measures. This is mainly due to the fact that there is a lack of good methods and practice for measuring the impact of public interventions.
4. **How can public procurement be used to enhance innovation?** Several Member States are considering, planning or already piloting new policy initiatives aimed at innovative public procurement. Other Member States are perhaps considering it. Public procurement can be a powerful instrument in enhancing innovation. However, it is far from straight forward implementation. The design and implementation of innovative public procurement schemes must overcome several regulatory, governance and even social, political and cultural challenges. This makes innovative public procurement a relevant theme for policy learning and sharing of experiences.
5. **How to make Europe more attractive for investments in R&D and innovation?** As the barriers for mobility are decreasing, the most innovative companies and the best brains are moving globally into locations which are the most conducive for R&D and innovation. It is important that Europe, Member States and regions can improve the attractiveness of their innovation systems for European companies and researchers as well as international companies and researchers. All Member States are faced with the challenges of globalisation of R&D and innovation activities, which makes this a relevant topic for policy learning and coordination.
6. **How to ensure the coherence between national and regional R&D and innovation policies so that Structural Funds would best enhance R&D and innovation?** As the regions develop and their economic growth, as well as social and environmental development, becomes progressively more innovation-driven, the role of R&D and innovation increases also in the context of Structural Funds. One of the key questions in the context of using Structural Funds to develop R&D and innovation capabilities is coordination of several policies at European, national and regional levels. To identify and establish an optimal role for Structural Funds in the context of European, national and regional R&D and innovation policies can significantly increase the impact of Structural Funds. This presents a relevant topic for learning especially for less developed regions, which have significant Structural Funds at their disposal. On the other hand, policy coordination in the context of Structural Funds is a wider issue covering also national and European policies.
7. **What kinds of policies can be effective in stimulating R&D and innovation in services?** Traditionally and still today, most R&D and innovation policies and systems have been developed for technological innovation in manufacturing. There is a need to gear existing R&D and innovation policies so that they would better address service innovation. There is also room for more service innovation oriented R&D and innovation policies and policy measures. While many Member States have identified the increasing importance of service innovation, very little concrete policy action has been taken. This is obviously a topic where mutual learning of

new policy initiatives and the realignment of existing policies measures to better address service innovation would be likely to enhance the renewal of R&D and innovation policies.

8. **How does open innovation change R&D and innovation policies?** R&D and innovation are increasingly collaborative and take place in various types of network arrangements. Increasing interdependencies between R&D and innovation actors and the need to speed up innovation processes has led to establishment of various types of more or less open R&D and innovation platforms. This development is well in line with R&D and innovation policy objectives and policies should therefore support it. However, as this development blurs traditional boundaries between companies, universities and research institutes and creates new public-private structures, policies should be adapted accordingly. Adapting existing R&D and innovation policies and creating new policies and measures to support open R&D and innovation is an area where Member States and regions can benefit from learning and policy coordination activities, especially since many of these open platforms extend over regional and national borders.

The final report of the group will contain more detailed and elaborated analysis of policy measures related to research policies within the general framework of the R&D and innovation systems addressed in this intermediate report.

1 Description of the work

This report has been prepared by the "Follow up of the Lisbon strategy" expert group created by the European Commission to assist The Commission services in the analysis and monitoring of the research part of the National Reform Programmes (NRPs).

The mandate of the expert group was to analyse the Member States' NRPs with the special focus on R&D. The group was asked to:

a) review Member States' 2005 NRPs and provide feedback on DG Research's own assessment;

b) identify Member State and EU level policy trends and emerging issues[1];

c) identify areas that would benefit from greater policy co-ordination and where OMC could be applied;

d) provide advice on the coherence of Member States' policy-mixes and on further challenges to be considered by national policies

The expert group was asked to produce the following two reports:

1. An **intermediate report** analysing Member State and EU level policy trends based on NRPs and identify areas where greater policy co-ordination will be beneficial.

2. A **final report** including a deeper assessment of national policies, the coherence of policy-mixes and further challenges.

This is the intermediate report prepared by the expert group consisting of the following members:

- Gonzalo León (chairman), Vice-rector for Research of the Technical University of Madrid; former Secretary General for Science Policy of Spanish Government, Spain
- Sylvie Inizan, Administrative and finance Director of the Observatory of Science and technology, OST, France, former Deputy General Secretary of the National Committee for Research Evaluation, France
- Raoul Kneucker, Professor, Political Science, University of Innsbruck; former Director General, Research and International Affairs of the Austrian Ministry of Education, Science and Culture, Austria
- Stefan Kuhlmann, Professor, Foundations of Science, Technology, and Society, University of Twente, The Netherlands; former Director of Fraunhofer Institute for Systems and Innovation Research (ISI), Germany
- Claire Nauwelaers, Research Director, UNU-MERIT, Maastricht Economic and social Research and training centre on Innovation and Technology, University of Maastricht and United Nations University, The Netherlands
- Véronique Timmerhuis, Secretary General of the Dutch Advisory Council on Science and Technology Policy (AWT), Netherlands

[1] The original mandate covered also the identification of Member States' good practices. Different focus (on new vs. the most important measures) and the great variation in the level of detail between Member States' NRPs, however, does not allow identification of good practices with sufficient reliability.

- Jari Romanainen (rapporteur), Executive Director, Activation, Tekes, Finland

The work to produce this report was based on thematic contributions from individual members of the expert group and discussion of relevant topics in 3 joint meetings (24-Feb-2006, 4-Apr-2006 and 3-4-May-2006) and one additional meeting with the Commission services (12-Apr-2006, chair and rapporteur only).

Opinions expressed in this report are the opinions of the members of the expert group and do not necessarily reflect the opinions of their respective employers or the opinions of the Commission.

The context: Follow-up of the Lisbon strategy

The re-launched Lisbon strategy was endorsed at the 2005 Spring European Council following a mid-term review of the original Lisbon agenda and progress made. The re-launched Lisbon agenda is essentially based on the same original objectives, but is more focused on economic growth and job creation.

In March 2005, all EU Member States were called upon to take ownership of the re-launched Lisbon process paying special attention to fostering growth and employment in their countries.

In June 2005, the European Council adopted Integrated Guidelines for Growth and Employment – a more concrete guidance on how to translate the above mentioned 'ownership' and strategic goals into national action plans. The Integrated Guidelines represent a Treaty–based detailed framework of macroeconomic, microeconomic and employment policies for growth and jobs in Europe.

Based on the guidelines, all 25 Member States produced 3-year National Reform Programmes by the end of 2005. The National Reform Programmes are expected to become key instruments in the new economic reform governance system within the EU. These programmes are to hasten reforms at the national level in all Member States and make national governments take more responsibility in the Lisbon process.

In March 2006, the Spring European Council highlighted a number of policy recommendations based mostly on the Commission's Annual Progress Report and key issues identified in it. The European Council recommendations especially highlighted knowledge and innovation for growth and emphasised the need for Member States to vigorously implement their NRPs. The Council also confirmed the validity of the Integrated Guidelines for Growth and Jobs (2005-2008).

The significance of the National Reform Programmes lies not just in the programmes themselves, but more on the changing roles of Member States and the Commission in the governance of the reformed Lisbon process. The "ownership" of the process is shared between the Community and the Member States and the role of the Commission is more of a facilitator and an equal partner, rather than a manager or a controller.

This places a rather strong emphasis on National Reform Programmes and the governance process related to these programmes, especially the Open Method of Coordination (OMC).

Aim and scope of the report

This report is based on the analysis of the NRPs prepared by the Member States, the assessment of those programmes by the Commission services and other material closely related to the OMC process made available to the expert group by DG Research. Furthermore, the analysis especially focuses on R&D and innovation, which are covered mainly by the Integrated Guidelines 7 and 8. Consequently, the analysis performed has been limited to Research and Innovation chapters of the NRPs.

Since the purpose of the NRPs is to highlight what each Member State plans to do in order to reach the Lisbon objectives, the focus is naturally on reforms, i.e. the most recent and planned new policy measures and those with the highest expected leverage with respect to Lisbon goals. Subsequently, this report does not even attempt to present a comprehensive analysis of Member States' R&D and innovation policies nor national research and innovation systems.

Instead, the aim and scope of this report is to identify current policy trends across the 25 NRPs and areas where further or deeper policy co-operation, coordination and learning would most likely provide added value based on the measures Member States have selected to highlight in their NRPs.

The first part of the report presents the expert group's analysis of the NRPs. It focuses on three key issues. It starts in Chapter 2 with an analysis of the NRPs in view of the Lisbon objective to raise R&D investments so that the EU average approaches 3% of GDP (with 2/3 funded by the private sector) by 2010.

This is followed by a discussion in Chapter 3 of the key challenges related to the governance of R&D and innovation policies in Europe, an issue which is recognised for playing a crucial role in initiating and carrying out the necessary reforms and improving the effectiveness and efficiency of policies while strengthening the ownership of the Lisbon strategy.

The first part ends with Chapter 4, providing a more thematically focused analysis of R&D and innovation policy measures, beginning with an overall look into major trends in policy mixes according to the NRPs, continuing with a closer look into policy measures which have received most attention in the NRPs, and ending up with an analysis of the most obvious gaps in the NRPs with regards to modern R&D and innovation policy.

The second part of the report builds on the observations from the analyses presented in the first part. This second part consists of Chapter 5, proposing sets of recommendations. It starts with the main messages identified by the expert group. This is followed by a series of more detailed recommendations addressing the R&D and innovation policy governance processes and how they could be improved to facilitate more coherent, effective and efficient policy design and implementation. Recommendations also cover the OMC process and the role of NRPs. The last set of recommendations is a list of issues the expert group has identified as potential areas for policy learning or stronger policy coordination.

This report does not contain a country-by-country analysis of Member States' NRPs, nor does it contain any systematic attempts to identify Member States' good practices. The main reason for this is the great variation in the level of detail between Member States' NRPs, which makes any comparative analysis rather challenging. This is partly due to the fact that the Integrated Guidelines do not provide a clear enough framework

for presenting the relevant information and partly because Member States have decided to use the Integrated Guidelines in different ways (see Chapter 2).

2 The role of NRPs as policy documents

The NRPs have been elaborated by the 25 national governments of the EU Member States, following the revision of the Lisbon Strategy including a stronger focus on growth and employment and delivery. The idea is that each NRP should follow the Integrated Guidelines adopted at EU level, indicate the specific challenges faced by the country in each area, and describe the policy responses to address these challenges, with a view of contributing to the overall Lisbon objectives at EU level. The aim of the exercise is for the Member States to identify a coherent mix of policies which together would bring the leverage effects towards the Lisbon objectives.

A horizontal reading of the R&D and innovation aspects of the NRPs shows that there is some distance between the exercise as defined above and the documents delivered by the Members States. The NRPs also fall short in a number of elements related to good governance as detailed in Chapter 3.

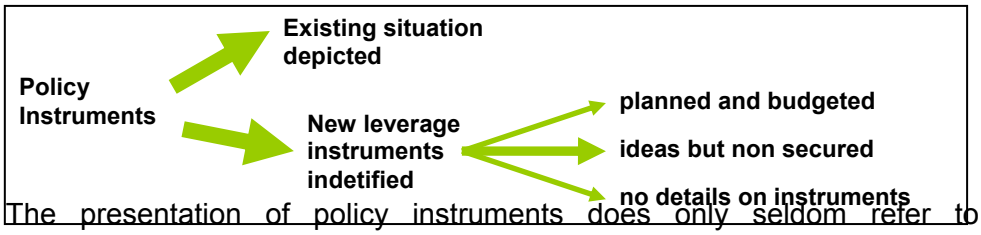
Focusing only on the R&D and innovation part, the following elements can be put in evidence:

- The majority of Member States have, in recent years, already adopted policy frameworks for R&D and innovation preceding the NRPs. Therefore, for some of them, the value-added of the NRP is difficult to ascertain and part of the work must have consisted in rewriting existing policy documents in a new format. In some of the NRPs the reference to existing programmes is stated explicitly. This raises questions as to the real political value of the NRP documents as a reference to R&D and innovation action plans or more generally, growth and employment policies in the Member States.

- A strategic policy document such as the NRP should ideally contain three key elements: 1) a diagnosis of the strengths and weaknesses of the research and innovation system; 2) the definition of broad policy goals; and 3) the operationalisation of these broad goals into more practical objectives and concrete instruments.

  Most of the NRPs are much more developed on the second, rather than on the first and third aspects. That is, analyses of the national research and innovation systems are very limited, in most cases to the discussion of key indicators, and include little consideration on the functioning of the system or on the main bottlenecks to be addressed in priority.

  As regards the instruments to implement the broad policy goals, some Members States merely describe an existing situation while others pinpoint the new instruments that are identified with respect to the Lisbon challenge. When leverage instruments are identified, it is only in a few cases that these are presented in concrete terms and planned and budgeted. In most of the cases, the instruments are still very generic and not detailed, and their implementation is not secured. In a few cases details on the instruments are missing altogether.



- The presentation of policy instruments does only seldom refer to the effectiveness of current policy mix. As a result, the rationale for introduction of a new instrument, its role within the wider portfolio of instruments and the priority conferred to this instrument, are generally not spelled out. Instead, the NRPs present a list of instruments without clear prioritisation, further hindered by a lack of information of foreseen funding. In such a situation, it is difficult to see to what extent the NRPs will effectively influence the direction of policies and induce the necessary shifts sought for by the exercise.

As mentioned above, the core of the NRPs consists of broad policy objectives rather than of detailed exposition of corresponding policy instruments. How are these broad policy objectives spelled out? How do they relate to other policy measures not described in the NRPs?

The idea at the launch of the process was that the NRPs would follow the Integrated Guidelines provided at EU level. Thus, for R&D and innovation policy, the main focus would be on Guideline 7, with a secondary account of Guideline 8. A number of NRPs have indeed used these guidelines to structure their R&D and innovation related actions under the microeconomic chapter, but not all. In some cases, the presentation of policy objectives has followed another logic and it is interesting to compare the various ways in which national governments have structured their policies for R&D and innovation.

The following can be noted when analysing the definition of broad objectives for R&D and innovation under the NRPs:

1. Most of the Member States place R&D and innovation as a primary priority within their set of microeconomic policies: R&D and innovation stand out as a main pillar among few other micro policies. Several Member States have placed this policy field as subordinate to another broader policy capturing the support to companies' competitiveness. This broader policy goal typically includes elements of industrial policy, environment-friendly innovation, business environment, competition and entrepreneurship and employment (Integrated guidelines 10, 11, 13, 14, 15, 23, 24). A positive correlation between R&D-intensity of a country and the degree of priority on R&D policy seems present, but this correlation is weakened by a number of counter-examples.

2. All but one Members States have integrated guidelines 7 and 8 when defining their R&D and innovation policies, showing a willingness to ensure a continuum between science, research, technology, and innovation policies. The development of the information society (Guideline 9) is also frequently added into this policy area. The name of this policy area includes a variable mix of the words: knowledge, research and development, innovation, indicating the instability of the boundaries of the R&D and innovation policy concept.

3. The value of the Integrated Guidelines for structuring R&D policies appears as limited, independently of the level of maturity of national R&D and

innovation policies. The governments of 10 Member States only (equally split between old and new Member States) followed the two guidelines 7 and 8 to present their policies. For 10 others, the logic is rather one defined at national level, but an effort is made either in the text or in an annex, to relate these national priorities to the guidelines. The remaining 4 Member States do not refer to the guidelines at all.

4. Specific accents are visible in some Member States' broad goals, referring to the knowledge society or to the concept of sustainability linked to knowledge and innovation.

3 The Barcelona R&D investment objective

The most important quantitative objective in the Lisbon Strategy is related to the main milestone approved in the Barcelona Council in 2002: to raise the level of R&D investment in the EU as a percentage of GDP in 2010 up to 3%, 2/3 of which should be funded by from private sources. In fact, it is the most visible objective for the public opinions (counted as the attention obtained in the mass media) and the basis for the reform commitments at the national level.

Member States reacted to this global objective by incorporating quantitative targets and specific policy measures in their NRPs. In some cases, countries defined specific targets in the time period considered (2008 and 2010); in other cases, they only partially cover them (i.e. on public expenditure) or for other periods of time (e.g. 2013 or 2014). It is also relevant to mention that some countries only made public quantitative targets after the submission of their NRPs and in the run-up of the 2006 Spring European Council. At this moment, all Member States have defined quantitative targets.

Some Member States referred in their NRPs to specific reasons why they have selected, in a first instance, not to declare a fixed quantitative objective, such as industrial structure or inability for the government to set quantitative objectives for the private sector or for highly autonomous regions. It is worth noticing that as the attainment of these targets follow the non-binding nature of OMC, there are no legal consequences to success or failure (except from the political standpoint).

The 3% and 2/3 objectives have been discussed widely among experts. The discussion has clearly shown that setting quantitative objectives of this kind is not straightforward. First of all, even though competitiveness increasingly relies on innovation, raising the level of R&D investments does not alone guarantee more innovation or better competitiveness, growth and jobs, which in the end are the ultimate Lisbon objectives. This is because the relationship between R&D and innovation is not frequently a direct one, and innovation depends on many other inputs and conditions than R&D investments.

Secondly, if Member States are assumed to take ownership and therefore the responsibility of the Lisbon process, it is not credible for national governments alone to commit to quantitative objectives of which the attainment depends mainly on the action taken by the private sector and in some cases autonomous regional governments. This emphasises the need for better governance processes in order to reach a shared national level commitment of all key stakeholders including regional governments and the private sector.

Thirdly, the quantitative objective might take the attention away from the real issue, which is the need for structural reforms at all levels of the European research and innovation system. Too much attention to ambitious quantitative objectives and failure to reach them sends out a wrong message. Whether the 3% objective is reached by 2010 or not is eventually not that important. What is important is that Member States initiate reforms which have a longer term impact on the competitiveness of Europe.

Despite these problems, quantitative objectives can also be a powerful tool, as long as there is a shared understanding among all stakeholders of the nature of these more visible quantitative objectives and the underlying need for reform. The quantitative objectives should not be taken literally as a measure of success or failure of the Lisbon process.

The main benefit from setting the 3% objective has been a significant increase in political attention towards R&D and innovation in Member States. In many cases, increased political attention has also led to action. Several Member States have initiated reforms which without the Lisbon process might not have been taken at this time. R&D and innovation have increasingly become a priority topic in budgetary discussions with the attempt to look for longer term commitments at the national level.

Peer pressure (from Commission or from other Member States) to define quantitative targets (even in those cases where initially figures were not included in the NRPs) could obtain “figures” but not necessarily a coherent reform agenda and thereby credibility especially among private stakeholders. In this sense, to define intermediate targets and specific follow up mechanisms seems essential.

On the basis of the gap with respect to the present situation and the performance in the last five years, the level of the targets defined by many Member States in their NRPs and the probability of reaching those targets by 2010 can be considered too ambitious. Even if the Member States would be able to double the growth of national R&D investments from the last five years, it is likely that most would still fail to reach their objectives.

Overambitious objectives for R&D and innovation present two major challenges. First of all, R&D and innovation is strongly path dependent. This means that any policies or measures aiming to enhance R&D and innovation should be based on a sufficient understanding of the relevant prior developments of the research and innovation system. The more the necessary structural and institutional changes aim to alter culturally embedded traditions and practices, the longer the time typically needed. For example, creating the necessary trust to enable networking and clustering between companies in a highly competitive and low trust business culture is likely to take much longer than in a less competitive and more trusting business culture.

Another challenge closely linked to the first one is the trust of the private sector towards the government (both national and regional). What is the government’s track record in setting similar objectives and realising them? Can the private sector trust that the government decisions now and in the future will continue to honour the commitment to these objectives? One visible decision which can be interpreted to be a sign of lack of true government commitment can seriously corrode the trust and reduce the commitment of the private sector. The same applies to the relationship between national and regional governments.

It is therefore vital that the commitment in the form of R&D and innovation budgets and actual implementation of concrete policy measures is in line the level of political ambition declared by the quantitative objectives. For credibility and trust, it is also

important that the national government makes a sufficiently long term commitment both in budgetary terms and in the form of practical policy measures.

Whether Member States have identified these challenges and what kinds of strategies they have selected to enhance trust and credibility is information that is not available in the NRPs.

In order to reach the 2/3 objective at EU level, Member States should aim to maximise the leverage of public investments in R&D. Many Member States have presented new schemes in the form of tax incentives, seed and/or Venture Capital and various incentives for innovative start-ups. What are missing from the NRPs are any estimates or targets on how these new schemes really leverage private R&D. This would involve both an assessment of the current leverage effects of (or problems with) existing measures, and the expected effects from the new or planned measures.

There is a clear need for developing both the NRPs and the monitoring of the progress made by Member States with respect to how public R&D investments really leverage private R&D investments. What types of policy measures maximise the leverage effect and really enhance private R&D and innovation in specific conditions?

Despite the fact that it is unlikely that the EU will reach the 3% and 2/3 targets by 2010, Member States are making reforms which are likely to result in significant progress towards the Lisbon objectives. This should be regarded as a major success, even if the level of R&D is probably going to reach only 2.4-2.7 % of GDP and the private share will remain under 2/3.

Continuing with the necessary reforms both at Member State and at EU levels is much more important for competitiveness, growth and better jobs – the fundamental Lisbon objectives – than reaching any particular quantitative targets for R&D. It is therefore important that Member States and the Commission continue to identify the necessary reforms, define realistic goals and indicators to follow the development in each Member State and in Europe and thereby strengthen the commitment of all stakeholders, both public and private to developing Europe into a leading knowledge based economy.

Quantitative targets should be seen in this context – as consequence of the evolution of Member States, not an *a priori* mechanism. However, quantitative targets can also be a powerful way of strengthening the trust of private actors towards the government. Governments should therefore use credible quantitative targets specifically to show their long-term commitment via continuously growing budget allocations to education, R&D and innovation. The combined effect of these three policies (with quantitative targets well above present ones) can support a real reform towards a knowledge-based society.

4 Managing the process: R&D and innovation policy governance

The governance of R&D and innovation policies plays a key role in both setting and achieving the Lisbon objectives. Governance refers to processes and activities put in place to ensure that relevant policy needs are identified, appropriate policies are designed and implemented effectively and efficiently and that the necessary learning takes place.

The increasing importance of governance stems from the new role of governments; as facilitators and equal partners, rather than controllers of research and innovation systems. Furthermore, governments need to design and implement policies in increasingly complex, highly networked and multi-layered research and innovation systems that are continuously changing. In this new role, governments need the contribution of all stakeholders to help them identify the relevant challenges, design the appropriate policies and implement them effectively.

One of the key challenges of multi-level governance is to identify: Which policies should be designed and implemented at which levels? Who should be involved, how and at which levels? Finding the right answer to those questions can have a significant impact on the effectiveness and efficiency of policy implementation.

The character of governance – including the way in which identification of policy needs, and the design and implementation of policies is organised in the form of processes and structures – can therefore have an enormous impact on the coherence of policy mixes and their effective and efficient implementation. Policy coherence has many dimensions:

- Horizontal coherence – coherence of R&D and innovation policies across sectors, ministries, departments, directorates, etc.
- Vertical coherence – coherence of R&D and innovation policies across governance levels, e.g. between EU, national and regional
- Temporal coherence (dynamics) – coherence of R&D and innovation policies over time, predictability of policy changes

The discussion later in this chapter (and this report) focuses mainly on horizontal and vertical coherence.

The institutionalisation of governance processes – the little that is presented in the NRPs – does not yet reflect a new systems oriented governance approach to R&D and innovation policy. The absence of a systemic orientation can also be interpreted – at least partly – as a consequence of the fragmented structure of the Integrated Guidelines.

The systems oriented governance approach should be reflected in the NRPs in the form of systemic policy instruments that support the following functions:

- Taking into account the systemic nature of research and innovation, including the notion of complex, non-linear interaction between relevant actors and factors
- Superseding tunnel visions, cutting across institutional and national borders, avoiding dead-locks of narrow negotiation arenas, by applying a holistic notion of research and innovation policy, keeping in mind the inter-relation of different policy areas, fostering cluster approaches, etc.
- Reorganising state administrations enabling flexible horizontal co-ordination and exchange among formally divided entities
- Elaborating forms of institutionalised co-ordination also between the European level and the national and regional level.

Governance in the NRPs

In the current versions of the NRPs, this question of governance is not well developed, and it is not easy to assess the stage reached and the challenges in each case. Nevertheless, several points regarding governance of R&D and innovation policy can be made with respect to the NRPs:

1. There is a need for an overall vision and strategy for R&D and innovation policy.

   Is there a strategy plan which links or encompasses all the separate policy lines in Member States, ideally within a pan-European scope? And does this work? Only a few Member States mention such a 'big picture' strategy in their NRP. Does it really help in getting focus in policies? And what about the countries that do not mention an explicit overall strategy: how fragmented are their policies? Does it hinder them?

   While the more traditional research and innovation policies were basically legitimised by the concept of market failure, modern research and innovation policies also have to deal with system imperfections. There is a need for horizontal and systemic policy co-ordination, which is reflected only in a few NRPs, and only superficially. In short, governments could make attempts to take part (and if necessary: take the lead) in the role of a research and innovation system builder and organiser by making full use of policy measures and ensuring coherence over regional, national and European governance levels.

2. There is a need to set priorities and identify the right balance.

   Relatively little to virtually no attention in NRPs is focused on how or where to invest all the intended additional R&D-funding, how to put the additional investment effectively to work. One key question is the balance in investing in structural bases (universities, infrastructure, and healthy basic funding) versus project and therefore temporary competitive funding.

   Another balance to take into consideration is emphasis on more fundamental research or more applied oriented? And of course in a more detailed sense the question is always in what themes or fields of knowledge should a country invest? Which part should be left "free" and which part focused on priority themes? Foresight exercises could be of use here.

   Yet another underlying issue that is not explicitly spelled out is: should the priority go to reinforce science-based innovation or providing conditions for innovation in a broader sense?

   Anyway, in the NRPs the focus is on getting more funding (getting political commitment for it), and not on the follow up question: what to do with that money, how to spend it wisely and effectively? This is the big question of priority setting: how to make choices on what to do at all and what to do first? And of course: who chooses? These aspects should deserve much more attention in the future as a part of policy learning activities.

3. There needs to be a real and wide ranging commitment of all stakeholders.

Vision, priority setting and balance are necessary elements of good R&D and innovation policy governance. They are, however, not sufficient. How to realise real commitment needed from the different partners involved in making the knowledge society a success (i.e. different parts of government, businesses, PROs, unions etc.) is also crucial to turn policy decisions into reality. Several NRPs mention explicitly how Member States operate and how important a good social partnership is for their effectiveness. In other cases the degree of support from key stakeholders with regard to policy priorities is unclear.

4. The quality of policy implementation needs attention.

   In the NRPs, almost no attention is paid to the quality of policy implementation. The text focuses on the ideas and good intentions formulated in policies themselves. Meanwhile it is becoming increasingly clear that the overall effectiveness and efficiency of policies has everything to do with the quality of policy implementation: how to manage policies in the process of implementation, how to monitor and evaluate them?

   Implementation has a lot to do with issues like trust between relevant actors in a dynamic research and innovation system (high trust governance instead of low trust that goes together with detailed steering mechanisms). Also highly relevant is: how to organise the intended policies in such a way that they are persevered (also after the next elections). Stability of prospects (parties that know what they can count on) and perseverance go hand in hand.

   A central element of improved policy implementation is a well-developed evaluation culture. In terms of the Lisbon targets policy evaluation aiming at a better understanding of behavioural additionality is a central condition for making attempts to successfully increase the research and innovation orientation in industry.

Global, European and regional dimensions in the NRPs

Globalisation is a common challenge to all Member States and the European Union as a whole. While it is not the purpose of this report to go deeper into the challenges of globalisation in general, it is necessary to consider this challenge in the light of R&D and innovation policy governance in the context of NRPs.

“International” carries three different meanings in R&D and innovation policy today: "global" as the new nuance, "international" in the old usage of the word originally determined by international law, and "European" as a special dimension applicable only to the Member States of the EU. The Lisbon strategy, for instance, refers to “global” and “international” as a policy goal but asks for “European” measures to achieve it, both on European and on national levels. The measures at European level, foremost the Framework Programmes of the EU, are “European” in nature, and are consequently, with the exception of the EEA relationships, not “international”.

As mentioned above, the NRPs, as their name indicates, are conceived as “national” exercises: the international dimension of R&D and innovation is often not discussed, and international cooperation for purposes of R&D and innovation reforms is seldom recognized.

Of course, in NRPs international cooperation is seen as an implicit part of certain national measures, such as attracting researchers or bringing back former national researchers who had emigrated or had been invited to fill positions in other countries; or international cooperation is implicitly taken for granted, as in supporting trans-regional networks. It is also understood that a NRP must inevitably focus on the national R&D and innovation system and will design appropriate national reform measures.

Still, was it an omission? Or was an effective instrument disregarded?

Policymakers, both on the national and on the European levels, should ask in which way will international cooperation coherently and systematically contribute to stimulating, improving, and reforming the national R&D and innovation systems, and consequently, help to advance, expand, and promote the European R&D and innovation system as a whole. In particular, how can international cooperation make the European system more competitive?

For this reason, international cooperation should not be treated in a separate chapter of the future NRPs, but rather as an integral (and explicit) part of the national policies.

What applies to international cooperation in general, is even more relevant in the intra-European context. In R&D and innovation policy, the EU remains an international organisation, however with decisive federal or supranational elements. It follows from these supranational elements, that Member States are supposed to and do in fact, act both in their national interests and at the same time, in the interest of European integration when deciding on European programmes. On the national level, Member States may design their national R&D and innovation policies and use their own programmes, but at the same time, they use the European programmes to advance their own national interests. In that respect, "European" becomes part of national policies.

In this respect, national R&D and innovation policies do have a dual objective or mission. R&D and innovation is both a national and a European responsibility, according to the EC Treaty. Their relationship is based on the principle of subsidiarity, which implies or presupposes coordinating national and European policies, i.e. in both directions. The EC Treaty provides for several coordinating mechanisms; OMC was agreed by the European Council to support it. The OMC can be argued to be a major social innovation in coordinating European research and technology.

Following this dual mission of national policies, a NRP may consider e.g.

- how to support existing research groups or stimulate the creation of new groups in order to increase national participation in FP 7, in quantitative and qualitative terms;
- how to prepare for participation in the new European Research Council activities (this is also related to FP 7);
- which infrastructures should be set up through national, regional, bilateral, and/or multilateral efforts of Member States;
- similarly, which new technology platforms, or in general which new activities should be started under Art 168 and 169 EC Treaty

The Framework Programmes already provide – as these examples demonstrate – a great number of possibilities of cooperation, and of promoting cooperation. In conjunction with the Community efforts towards strengthening the European Research and Innovation Area (ERIA), NRPs may specifically consider ERIA initiatives as national R&D and innovation stimuli by planning and implementing regional, bilateral,

and multilateral collaboration. The potential of regional cooperation is certainly not yet sufficiently exploited. The NRP may also emulate some of the Community programmes on the national level, for instance, financing the creation of (regional) networks and platforms rather than writing and financing new national research priorities, which often do remain national in character instead of being opened to other European research teams. It should be remembered that the latter was the explicit intention and objective of FP 6.

Another governance related issue is the role of regional governments. The lack of dialogue between national and regional governments in the preparation of NRPs is quite evident from the way regionalisation issues are presented or not presented in the NRPs. It is not very likely that regional governments, especially in Member States where regions have high degree of autonomy, would commit to such NRPs, in cases where regional governments have not been sufficiently consulted and the role of the regions have not been sufficiently taken into account. This is also an important area for policy learning between regions in all Member States.

Issues related to regionalisation that could and should be covered by NRPs include the role of Structural Funds in facilitating R&D and innovation, regional clustering of R&D and innovation, regional specialisation and its impact on the realistic levels of R&D and innovation investments, and the appropriate balance between cohesion and excellence. Furthermore, all of these issues should be analysed in the context of vertical policy coherence, i.e. complementarity, additionality and appropriateness of policies and measures at various governance levels. What policies and measures are most appropriate to design and implement at European level, national level and regional level? How should policies and measures be designed and implemented (and monitored) at these different levels so that they would best complement each other and enhance the effectiveness and efficiency of the overall policy mix?

5 Focus of the reforms: Trends in policy measures

Towards an appropriate policy mix

Investing more public funds for R&D does not ensure more innovation. Extensive research on innovation systems over the last decade has revealed clearly that enhancing R&D and innovation requires a mix of policy measures targeted at the most important failures of the research and innovation system. This involves typical instruments from the R&D portfolio, but also instruments and conditions from outside the traditional sphere of R&D and innovation policy. Therefore, the effectiveness and efficiency of policies is not determined by individual measures but by the appropriateness of the mix of policies and measures applied in specific national and regional contexts.

The Member States are at very different stages of development towards a knowledge based economy and the same applies for their respective research and innovation systems. The diversity between regions is even greater. This means that the appropriate policy mix for one Member State can differ significantly from that of another Member State (or region). A significant degree of diversity is therefore expected to be found in the Member States' NRPs. To study this diversity from an NRP point of view, the policy mixes for clusters of countries which share similar characteristics in the knowledge economy are looked at, without entering into the details of each country's policy mix.

Thereby, since the NRPs do not accurately represent the policy mixes actually at work in Member States, the analysis is focused on the mere identification of the presence or absence of types of objectives and instruments in the texts of the NRPs. Another difficulty comes from the fact that the analysis has been focused only on Guidelines 7 and 8, while relevant elements of the policy mix might be hidden under other priorities. The range of instruments mentioned under the R&D and innovation chapters of the NRPs are assumed to adequately reflect the Member States' understanding of what constitutes this policy mix, even if de facto, other instruments are present elsewhere that will indirectly contribute to the goals of R&D and innovation policy.

Finally, the Expert Group is well aware that indicators used to build country classifications all suffer from well-known weaknesses to capture the characteristics of research and innovation systems, and the threshold to categorise countries in one or the other cluster has an arbitrary component.

The Member States can be classified according to their national R&D investments, innovation performance (see Annex 1) and the orientation of their innovation system (output- or input-oriented). Using these classifications and keeping in mind the limitations mentioned above, the following general conclusions can be drawn based on the information provided in the NRPs.

1. The clusters of best performing countries, both in terms of R&D expenditures and in terms of innovation performance, tend to be more active in developing priorities over a wide range of policy instruments, than countries which are lagging behind. This suggests a risk of increasing gap between the best "knowledge economy" performers investing more, and the worst performers, investing less. This situation could be even worse in some S&T areas like biotech or nanotech where the knowledge accessibility conditions the industrial positioning.

2. Clusters of countries characterised by a more efficient research and innovation system put a higher priority on policy governance and strategy, thus highlighting the importance of this "soft" element of the policy mix.

3. There are indications of two alternative roads followed by Members States to design their policy mix. One is the "R&D road", followed by countries with high R&D performance putting more emphasis on R&D instruments *stricto sensu* and on raising public expenditures on R&D. The other is the "Innovation Road" where emphasis is placed on innovation support measures, a route followed by countries with lower R&D intensity, average or low public R&D expenses and the new Member States. Those countries that are better placed in innovation performance than in R&D performance tend not to place a high priority on raising public expenditures on R&D while conversely countries ranked better in R&D than innovation, prioritise R&D spending.

4. Another trade-off seems to relate to the choice between a reinforcement of the national system or the opening up and linking up of R&D capacities outside national borders. The priority in investing in public R&D (nationally) correlates to some degree with country size, probably reflecting the more widespread belief in the need for national R&D strongholds in larger countries. Indeed, the need for internationalisation of the R&D system is clearly more present in small and medium-sized countries where the pressure towards the opening up of their research and innovation systems is even stronger.

5. Old and new Members States differ in the way they intend to raise effectiveness of their public research infrastructure: in new Member States there is a higher priority placed on the restructuring and improved management of public research organisations and universities, reflecting the building stage of their knowledge production system, while concentrating capacities in Centres of Excellence is a more widespread strategy in old Member States, especially those who are losing momentum with regard to the 3% objective. Countries with high public R&D expenditures do not place a priority on the reform of PROs and universities, probably because such steps have already been taken in the past. A difference is also visible in the use of public-private partnerships for research, which is a much lower priority in the new Member States.

6. Another aspect particular to new Member States, reflecting the ongoing transformation of their research and innovation system is the focus on regulatory changes. Despite the claims on regulatory hindrance for innovation in most Member States, a focus on this dimension seems in general shared only by by the NRPs of countries which are placed at the bottom or average league of R&D and innovation performers.

7. Leading countries, both on R&D investment and in innovation performance, in their NRPs do not place a priority in stimulating private R&D expenses, neither through direct or indirect incentives. However, indirect incentives are a priority for average performers in both R&D and innovation.

8. Reinforcing the attractiveness of S&T studies is a policy of the leading R&D and innovation countries, probably reflecting their need to address an important bottleneck in their research and innovation system. It is a priority in countries with high public R&D investments, as a complement to the reinforcement of infrastructures and project funding.

9. Countries which are characterised by an innovation system biased towards input performance are amongst the few that place in their NRPs a priority on technology procurement as a way to improve innovation.

10. The regional dimension of R&D policies is, as expected, not present in the NRPs of smaller and new Member States, and is seen to play a more important role in countries in the better performing (R&D and innovation) clusters. It is reassuring to note that Structural Funds' role is seen most relevant in countries in catching-up clusters and in those with lower R&D intensity.

Whereas the NRPs reflect differences in the needed reforms in Member States, there is reason to be concerned whether the policy mixes reported in the NRPs are diverse enough, i.e. to what degree Member States have really identified their specific needs for reforms as opposed to initiating reforms which seem to be popular among other Member States. The expert group is aware of the fact that larger countries need to manage a wider set of policy measures to address many types of performers in practically all S&T areas. Specialization in some domains is only possible in smaller countries or regions.

One of these concerns is related to innovative start-ups. NRPs seem to pay most attention to innovative start-ups, especially those originating from scientific research. While some of these companies do have a real potential to grow fast and become the

new microsofts, phillipses or nokias in longer term, their significance with respect to the Lisbon objective to increase the level of R&D in Europe is quite small. Creating jobs and economic growth within the next 5 year period relies mostly on the huge number of existing SMEs (and larger companies) in Europe. While the longer term development is equally if not even more important in some specific sectors, the balance of the SME policy mix seems a bit too biased towards science based innovative start-ups. Although encouraging more SMEs to engage in innovative activities is necessary, and likely to boost economic growth, it does not necessarily result in significant increase in private R&D investments.

Again, as mentioned above, in the absence of a clear exposition of the broad vision for R&D and innovation policy and of the expected leverage effects of this type of measure, it is hard to judge if such an implicit policy priority will be effective in leading the concerned Member States closer to the Lisbon objective or not.

NRPs also tend to focus very much on more and better R&D. Policies targeting the transfer and use of knowledge and skills with the aim to produce innovations are less emphasised. There seems to be a bias towards production of new knowledge and especially so towards high technology. Considerably less emphasis is put on transfer and use of existing knowledge and skills by SMEs. More emphasis could be put on e.g. policies and measures supporting the adoption of existing (and new) technologies and other knowledge and skills to enhance the innovation capacity of SMEs and policies and measures enhancing the commercialisation of new products.

Another bias in NRPs (and for that matter also in the Commission initiated European R&D and innovation policies) is the overemphasis on manufacturing industries and technological innovation. This is not to say that manufacturing or technological innovation would become less important, even though a lot of the manufacturing capacity will evidently move from Europe to China, India and other fast growing large markets. However, it is more than likely that the relative importance of services will increase in the future.

Manufacturing industries are increasingly integrating services into their businesses. Some companies even change completely from manufacturing to services, because manufacturing is becoming increasingly competitive whereas the demand for new services keeps increasing.

It is therefore of some concern that most NRPs do not recognise R&D and innovation in services at all, even though services represent 70-75% of most economies. While it is not a big surprise given that systematically planned and executed R&D and innovation in services is still quite new (apart from software, R&D, engineering and a few other specific business services) even for companies, Member States should at least recognise the importance of innovation in services and launch policy measures accordingly.

Besides service innovation there are also other forms of non-technological innovation which are not recognised by most Member States, at least in the context of Guidelines 7 and 8. The overall term for these might be social innovation, since they are mostly embedded in organisational structures and processes, communities of practice or ways in which social interaction takes place in the context of performing specific tasks. These have also sometimes been referred to as work place innovations, which emphasises the workplace and organisation of work as the context for innovation. Only a few Member States refer to any activities enhancing these social innovations under the research and innovation chapters of their NRPs, although research shows that social innovation could explain as much as 75% of successful innovations.

All of the biases in policy mix referred to here could present a good topic for policy learning, especially since a number of Member States are at early stages or have not even started to design and launch measures targeting these more recently identified policy challenges and other countries already active need to redefine priorities to accommodate additional funding.

Improving financing, regulations and support systems for innovation

It is important to realise that the NRPs do not provide a complete overview of all framework conditions relevant for enhancing R&D and innovation. Mostly changes or planned changes in some framework conditions are mentioned in the NRPs.

Many of the Member States have identified the need to focus on financing for innovation and modernising the regulatory framework (incl. IPR) by introducing new policy initiatives.

1. With regards to improving the financing for innovation, Member States seem to focus most attention on Venture Capital and tax incentives.

   New or updated tax credits are one of the most frequently planned initiatives among Member States. Various tax credit schemes focus on e.g. researchers' salaries, investments in innovative start-ups, etc. or are more general tax credits given for incremental or total R&D investments. The wide variety of different tax credit schemes provides a fertile ground for policy learning, which explains why they have already been one of the focus areas of OMC until now.

   The other area Member States have focused on in their NRPs is Venture Capital. Member States have launched or plan to launch initiatives which aim to improve conditions for risk and Venture Capital either by direct government funding or indirectly by improving the conditions for private Venture Capital investors.

   Many Member States have been very active in the past in creating a better overall tax climate in order to stimulate entrepreneurship and doing business in general. While this remains an overall objective in many Member States, only one mentions a new initiative in its NRP.

2. Most attention in the NRPs with respect to modernising the regulatory framework (incl. IPR) goes to reducing administrative burdens, especially for business start up and operation.

   Only a few Member States explicitly mention new actions aimed at improving regulations to enhance businesses and innovation under their research and innovation chapters.

   Several Member States, especially some of the new Member States, mention strengthening IPR regimes and their implementation/enforcement. Some Member States mention more specifically strengthening IPR-guidelines for public research.

Next to these two 'hot issues' there are four other issues that are also mentioned in several NRPs, but less frequently. These are streamlining and reforming the business

and innovation support system, stimulating an entrepreneurial culture, better tax climate (excl. tax incentives) and promoting competition and market liberalisation.

3. Several Member States' NRPs aim at streamlining and reforming their business & innovation support system.

   This involves harmonization of directives, less separate programmes, better access for SMEs etc. As mentioned above, this applies particularly to those Member States that are not particularly R&D-intensive. Unfortunately, in the NRPs policy measures are vaguely described and they are described more as objectives than implemented policies.

   Such reform plans appear to be especially relevant for some of the old Member States with a longstanding tradition of innovation policies. They have developed very many policies over the years, which were often put on top of each other. This has created a complex and potentially inefficient mix of measures. There is a need to streamline and reform the whole system to ensure effectiveness and efficiency.

4. It should be noted, that most Member States already have extensive programs for SMEs and/or start-ups, so only few new actions are put forward in the NRPs. Actions stimulating an entrepreneurial culture include general stimulation measures in the form of various entrepreneurial services and more focused measures for start-ups and innovative SMEs.

5. Several Member States' NRPs claim to actively promote competition and market liberalisation, but the appropriate policy measures are not mentioned or identified in the context of R&D and innovation.

The focus in Member States' NRPs on improving selected framework conditions for R&D and innovation raise a number of considerations:

1. It is very difficult to draw firm conclusions on the issues related to improving framework conditions and ensuring that companies operate in a sufficiently competitive and attractive environment based on the NRPs. Since the Guidelines do not explicitly mention what is to be understood by framework conditions Member States have come up with very different themes, or none at all under this heading. While we can be sure that all Member States have thoughts and/or policies for ensuring improved framework conditions, these are seldom recorded in the NRPs.

2. One important framework condition failed to get attention in the NRPs: standards & norms. Many companies express that standards are extremely crucial for innovations and that they would like to see a more (pro)active role of governments in this respect. This would indicate that new actions might be called for both in Member States and at EU level.

3. As to financing for innovation, deeper insight into the rationale of the NRPs choices and the specific instruments put forward would be very useful.

   Financing for innovation is not something that is of relevance only for the Member States in isolation. It is also relevant for the EU as a whole and for the Commission. One of the key problems in Europe is the fragmentation of the financial markets for innovation. European level reforms in VC markets to reduce the fragmentation, improve structures, and enhance specialisation

could make pre-seed, seed and early stage investments more attractive for private investors and thereby reduce the demand for public intervention.

4. Reducing administrative burdens by improving regulation is high on the priority list in several Member States, and rightly so. Too much and irrelevant regulations which all in all cost an enormous amount of effort and money for businesses are the number one annoyance mentioned by companies. Of course this does not only concern national regulations, but increasingly also European regulations.

5. Streamlining and reforming the business and innovation support system is happening in some of the old Member States with a longstanding tradition in innovation policies, but also in many new Member States. In the old Member States, this reflects the fact that a lot of policies have been developed in the last decades, quite often one on top of the other. In the new Member State, the concern is rather to create an environment to help firms which have yet too few experiences in the market economy imperatives, to adjust more effectively to new challenges.

Other framework conditions where European level activities are required are related to the IPR regimes and the overall tax climate. The use of IPR regulations to enhance innovation is more effective if measures are mainly implemented at European level. For example, cross-border collaboration in Europe is easier if IPR regulations do not differ between Member States. Significant differences in overall tax regimes, especially those related to businesses and innovation can lead into ineffective tax competition between Member States. The overall tax regimes should be conducive for innovation in the whole of Europe, not just in some regions or Member States.

Ensuring the availability of qualified human resources

This issue is quite extensively developed by Member States in their NRPs. It seems that most of the efforts of Member States, in terms of measures, have something to do with support to employment or favour science or technical education with one unique and logic objective: ensure the future of a priority sector by ensuring a sufficient supply of qualified researchers.

Besides general objectives to improve human resources for R&D, the specific measures presented by Member States focus on two main issues:

- support to firms mainly to enhance the links and mobility of researchers between universities, public research organisations and firms and training of researchers for and employed by firms;
- support to science mainly by supporting PhD students and young researchers

Measures aiming to increase the availability of qualified human resources for firms focus on enhancing the mobility of researchers between universities and firms. While the main focus is on the mobility from universities to firms, two-way mobility is also targeted by some Member States. Several measures are presented to enhance the mobility. These range from general encouragement and incentives for researchers and firms to decreasing barriers and improving employment regulations and social security systems. Typical incentives to enhance mobility are funding schemes for firms to hire PhDs and researchers. Some of these are in the form of tax reductions.

Another set of typical measures are targeting the industrial relevance of research at universities and public research organisations. These include alignment of curricula

and inviting business representatives to participate in the decision making bodies of educational institutes.

One form of mobility from public to private sector is in the form of start-up firms. Some Member States have designed specific measures to encourage researchers from universities to set up new firms. These can be in e.g. the form of specific grants or tax reductions or possibility to return in case of failure.

In some cases mobility is supported by organising some form of mediating services or portals to help match researchers capabilities and firm needs.

The goal of sufficient supply of qualified researchers is most often taken up in Member States in terms of policies geared towards producing more PhDs, that is to say classical academic researcher. What kinds of researchers are needed and for which kind of positions is not discussed in the NRPs. Knowledge societies do not only need trained researchers of the classical academic kind (PhDs, having done a thesis on an in depth question). Also qualified researchers with partly different competences that are highly relevant in e.g. in business, or government are needed. Member States don't "produce" researchers just for academia itself, but for the knowledge economy/society at large. More differentiation in researcher training is needed.

While most Member States identify the attractiveness of research careers as a key challenge, not many concrete actions or policies are put forward. This could mean that the issue of the not-attractive research career is acknowledged, but that Member States haven't found a successful policy approach. Some measures, however, are presented in the NRPs including regulatory means of increasing the flexibility of research careers in the public sector, pay increases for researchers, establishment of new research or higher education institutes or research facilities, increased support for PhDs (typically focused specifically on natural sciences and engineering), and creation of post-doctoral positions with additional grants. Some of these are specifically targeted to young researchers or women in research.

Especially new but also some of the old Member States are increasingly concerned also in the availability of qualified technical human resources and present measures targeting vocational education and training. Some Member States also refer to reforms in the educational system e.g. to strengthen the position of natural sciences and engineering.

Several Member States' NRPs are also targeting international mobility of researchers. This is mostly referred to in the context of improving the level of academic research or enhancing research careers. Measures include comparability of university degrees, regulatory reforms to enable hiring of foreign researchers and professors and new positions for foreign students and researchers. Especially some of the new Member States are also targeting measures to attract the return of expatriate researchers.

One of the issues missing in most of the NRPs is life-long learning. Although it can be argued that some of the measures presented in the NRPs support life-long learning, and that life-long learning is not an issue solved by specific measures but is rather a feature of the whole education, research and innovation system the low emphasis on the life-long learning might be a cause for concern. The requirements researchers face in the European and global labour markets are changing faster and faster, especially in industry and industry/academia interaction. The industrial and social importance of specific research or technology can change rapidly and lead to over- or undersupply of qualified human resources.

Reforming the Public Research Organisations

Member States' NRPs have identified a number of measures aimed at reforming public research organisations (PRO). These include:

- creation of centres specialising in industry/academia interaction;
- modernisation of universities;
- additional funding to industry/academia collaboration;
- enhancement of commercialisation of research results;
- creation of other types of specialised structures

Policy measures devoted to the creation of centres (of excellence) devoted to technology transfer, or devoted to create specialised units to support it in pre-existent public entities are very common in many countries. The effort in the creation of very highly specialised research centres with some involvement of private entities is more common in countries with more capabilities and expenses in R&D. Nevertheless, the effort in the identification of areas with high level research performance and potential interest to industry can be found everywhere.

In several countries NRPs the modernisation of universities has not derived in specific measures or it is mentioned in vague forms. It seems that the intended objectives can be simply obtained within the present legal framework in many countries, or that the necessary reforms have already been implemented.

New Members States of the EU have detected the need to transform their research institutions towards the cooperation with industry. These countries feel that the effort to open their PROs will require time and money.

Many countries intend to increase the funds for science-industry cooperation with some conditions of performance. The idea to condition additional funds for public research organisations if they increase the activity on technology transfer is proposed to overcome internal barriers. The use of Structural Funds for this purpose is practically not mentioned (with one exception) although it could be an important tool for several countries.

Policy measures oriented towards the improvement in the commercialisation of the results of research (directly or through the creation of spin-offs) in PROs is mentioned by many countries.

Specialised structures like clusters, S&T parks or other geographical oriented structures are mentioned in several NRPs. It is not clear though from the description in NRPs what the role of regional governments is.

Internationalisation as a strategic issue of PROs is not often mentioned as a driving force for new policy measures. It seems that most European countries rely on their nationals (in the country or abroad) to cover the research needs. Nevertheless, some countries mention the need to "recover" lost researchers with some measures to facilitate their reintegration into the national (public) system.

The policy areas mentioned are not independent. Figure 1 shows the connections between these policy areas (grouped for convenience). Thickness of lines represents the relative importance of the interaction.

CREST recommendations in the area of public research base and its links to industry are not far from the policy measures implemented by Member States. The link between Member States NRPs and CREST recommendations is relatively strong with respect to

legal reforms, i.e. “pursue or initiate necessary regulatory and administrative reforms, and support measures to enable public research institutions to develop more effective links with industry, in particular SMEs, while safeguarding their public mission in education and fundamental research”.

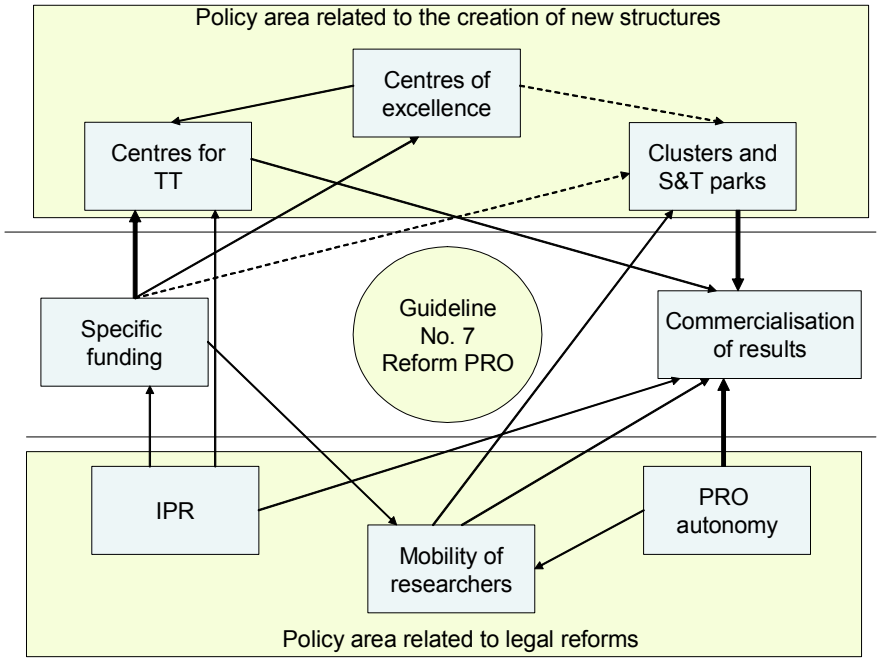


Figure 1. Grouping of policy measures in the NRPs, aimed at reforming PROs.

On the other hand, Member States present very few activities aiming to “increase the participation of industry and other stakeholders in the determination of priorities for public research”, which was another CREST recommendation. Probably, difficulties in PROs to accept external pressure from companies if it is not supported by extra funding and rewarding could explain it. To overcome this situation will require time and a change in mentality.

Figure 1 shows how policy measures could contribute globally to more common objectives also identified by CREST. These include:

- elimination of rules and practices in national programmes that impede European cooperation and technology transfer;
- gearing more research programmes towards the constitution of poles and networks of excellence by encouraging clustering or integration of resources at regional, national and European levels;
- enhancing the innovation impact of R&D programmes by encouraging and supporting the integration of innovation-oriented activities in research projects

The analysis of the policy measures included in the NRPs shows clear alignment with these objectives, meaning that a strong correlation (and consensus) can be found in diagnosis and therapies.

Enhancing public-private partnerships and technology transfer

Within the policy measures contributing to the Lisbon goals, Public-Private Partnerships (PPP) are especially important. They connect to two main weaknesses of Member States: the need to have long-term stable relationships between public and

private entities, and a different role for the public procurement under the risk-sharing principle.

Unfortunately, the explanation of the concept of PPP is rather fuzzy in the Integrated Guidelines. Member States can and have therefore interpreted it in different ways. As a consequence, policy measures presented under this Guideline are very different and not directly comparable.

The need to ensure that private firms could contribute 2/3 of the EU level quantitative target of 3% in 2010 is strongly dependent on the way that firms generate, access, and contribute to the knowledge generated from private and public sources. Therefore, the effectiveness of resources moved to industrial R&D is not totally separated from the PPP concept.

Before analysing the measures proposed by Member States, it is convenient to identify the policy areas related to this issue. Figure 2 schematically depicts a number of complementary perspectives that should be taken into account and the main interactions.

The analysis shows that Member States have included a broad range of policy measures into this objective. On the other hand, Member States have not included quantitative targets related to this topic. Policy measures proposed by Member States affect one or more areas identified in Figure 2.

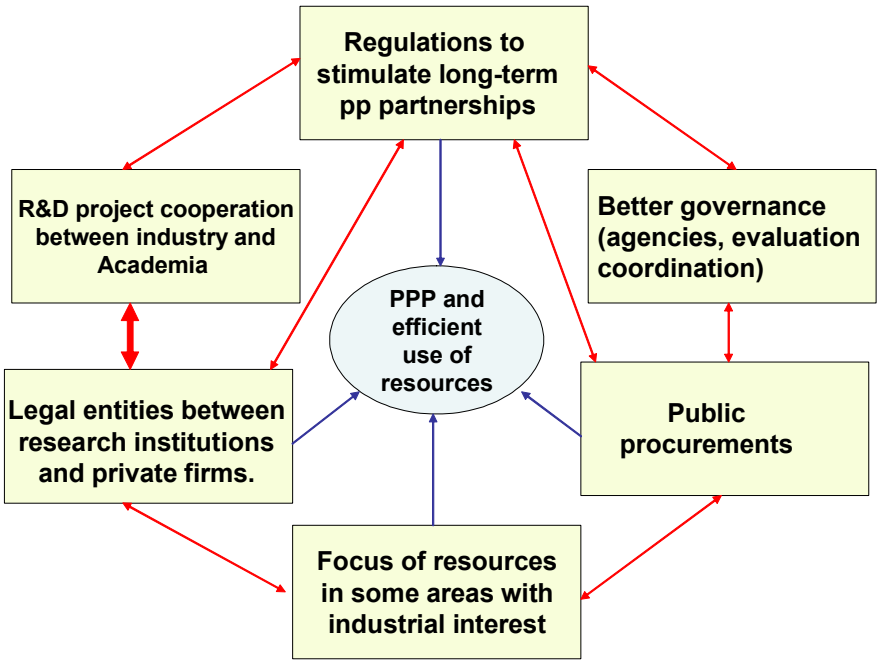


Figure 2. Perspectives to Public-Private Partnerships

Several Member States indicate that the demand for innovation will be strengthened through public procurement. Public procurement is clearly an underused mechanism to enhance the demand for innovation in Europe, especially compared to USA where a significant part of R&D and innovation incentives for private firms are channelled in the form of procurements. While several Member States have recognised this opportunity, according to the NRPs very few actual measures appear to have been launched yet. Whether this finding holds in practice or not, the Expert Group recommends to take a closer look at the rather complex regulatory regime combining State Aids and Public

Procurement. This is also an area where EU-level action could be useful both in supporting Member States and in providing an encouraging example for Member States.

How to develop the NRPs?

A number of issues emerge from the previous analysis. Together these issues constitute an agenda for further development and improvement of the NRPs.

More attention to policy governance

1. The whole issue of governance, and the ways and means developed by Member States to improve the design and implementation of their R&D and innovation policies, is not addressed in the NRPs. Perhaps this is because it is felt that this is a hidden "machinery" of policy setting. It is the claim of this report that the process is as important as the content in this area, if we want to see the NRPs used as effective guides to help Member States evolve towards the Lisbon objectives.

2. The fragmented structure of the Integrated Guidelines leads to NRPs, where policy measures targeting horizontal objectives such as R&D and innovation are dispersed over several headlines. This means that it is difficult to get a clear overview of many R&D and innovation related policies Member States are pursuing. Many of the problems related to the fragmentation have already been identified under the previous topics. A clearer exposition of vision, goals, targets and measures for R&D and innovation policy would help to understand the overall picture across the Guidelines.

More attention to the coherence of European, national and regional policies

3. It is rather surprising to find that Member States' NRPs do not recognise the link and complementarities between European level activities and Member States' activities. European level policies and national policies as well as regional policies should form a coherent mix, in which all level policies focus on those market and systemic failures best solved at each level. EU level, national and regional policies should complement each other rather than duplicate or jointly miss important measures.

   Member States should identify the contribution of EU level activities and the link between those and national measures. Especially the Framework programme, the new Competitiveness and Innovation programme (CIP) and Structural Funds are important to identify in this respect. Other EU level activities should not be neglected either as far as they are related to R&D and innovation.

   Another set of measures mostly missing from the NRPs consists of those related to regional policies. The reason for this is probably in the governance process, which in most Member States has not been sufficiently extended to cover the regions. Regions and regional governments are becoming increasingly important actors in R&D and innovation. It is therefore important that Member States establish governance processes that invite regions and regional governments to join the OMC. This will facilitate a better linkage between national and regional policies and eventually better policies.

More attention to measures aimed at enhancing the demand for innovation

4. It is particularly difficult to get any overall picture of policy measures aimed at enhancing the demand for innovation from the NRPs. This is mainly because of the structure of the Guidelines, which do not recognise the linkage between R&D and innovation and market dynamics. The only measure clearly linked to enhancing the demand for innovations is public procurement.

5. Norms and standards is another measure which can be a powerful tool to enhance the demand for innovations. Europe and especially Nordic countries leadership in mobile communications was due to early adoption of common standards. Gradually tightening emission norms for automotive industry have created a continuous pressure to produce innovations. The potential of standards and norms has not been used to the full extent. For example, the current attempts to create standards for nanotechnology can provide a competitive advantage for Europe. Similar advantages could also be created for other markets, e.g. via other environmental, health care or transport norms. While some Member States can act as leaders, most of these activities should be supported at European level.

More attention to the many forms of innovation

6. Most NRPs do not recognise R&D and innovation in services which is not a big surprise given that systematically planned and executed R&D and innovation in services is still quite new (apart from software, R&D, engineering and a few other specific business services) even for companies.

7. There are also other forms of non-technological innovation which are not recognised by most Member States' NRPs, while their potential for contributing to the Lisbon objectives is potentially huge. These types of innovations can be referred to as "social innovations", since they are mostly embedded in organisational structures and processes, communities of practice or ways in which social interaction takes place in the context of performing specific tasks.

6 Recommendations

The following recommendations focus first on R&D and innovation policy governance: How could it be improved in Member States and how could the NRP process contribute to better governance? The first set of main messages deals with this issue on a general level followed by a set of more detailed recommendations for Member States.

The last set of recommendations is a list of ideas for potential areas for future policy learning and policy coordination; possibly in the form of OMC groups or OMC-NETs (this and other related issues related to implementation is discussed in Annex 2). The list of ideas is only a preliminary one at this point. The final recommendations will be presented in the final report of this expert group.

Although there are already some references made in the previous Chapters to potential actions at the European level, it is not the purpose of this report to provide recommendations for actions at the European level. Those recommendations will be covered in the final report of this expert group.

Governance and the NRPs

Based on the analysis described earlier in this report and taking into account the conclusions of the 2006 Spring European Council, the expert group has identified the following main messages and recommendations with regards to improving the R&D and innovation policy governance processes related to the Lisbon strategy:

I. ***Member States should seize the opportunity of the NRP process to implement instrumental and structural reforms in their national research and innovation systems by using regional, national and European policies in a coordinated way.***

II. ***Member States should pursue structural mechanisms to involve all stakeholders (national/regional agencies, industry, research performers; etc.) and develop shared strategies to make the NRP's commitments credible. Then, the effort made in the elaboration of the NRPs (strongly constrained by calendar deadlines) should be periodically repeated to update their contents.***

III. ***Member States should explicitly state in their NRPs the overall vision and strategy for R&D and innovation to be pursued according to the Lisbon process and in the evolution of the national research and innovation systems by emphasising internal policy learning.***

IV. ***Member States should describe in their NRPs the planned strategy in translating the vision into prioritised policy measures.***

V. ***NRPs should provide a global view of education, research and innovation in policy definition and implementation with clear commitments and responsibilities of all stakeholders affected. From this view progress reports should be improved at national level to address research and innovation policy in a more coherent manner.***

VI. ***Member States should consider the strategic value of increased trans-national collaboration and progressive level of co-operation between national research and innovation systems to overcome the fragmentation of European research and innovation policies.***

VII. ***Member States and the Commission should stimulate the effective use of policy learning instruments both at national and European level, specifically in the framework of OMC, and other mechanisms at the international level.***

VIII. ***Mechanisms to assess the effectiveness of policy Implementation and impact are needed.***

On a more concrete level, the expert group has arrived at the following recommendations:

1. Member States should make concrete <u>long term budgetary commitments</u> for the public sector in accordance with the global quantitative target declared for 2010 and, if possible, at intermediate time (e.g. 2008).

   For the sake of credibility, Member State governments should focus primarily on setting objectives for public investments in R&D. The

appropriate and realistic objective for each Member State depends on the industrial structure, science base and the quality of the research and innovation system in general.

In view of the national objective, regions should be invited to set their respective objectives for public investments in R&D.

2. Member States should recognise and define specific measures to increase the interaction between national and European funds (Structural and Framework programme resources) in the context of the reform of State aids.

3. Specific attention should be devoted to demand side measures to create leading markets in Europe and boost innovation in the private sector.

   Policy measures aimed at enhancing the demand for innovation – such as public procurement and the use of standards and norms – are initiatives that should be used in connection to Lisbon strategy both at national and at EU level.

4. Member States should enhance the innovation impact of R&D programmes by encouraging and supporting the integration of innovation-oriented activities in research projects (e.g. knowledge management and diffusion, training activities, take-up measures for SMEs). This can be complemented with measures aimed at rewarding and motivating researchers to increase their interest in knowledge transfer activities.

Preliminary ideas about policy learning and coordination

The OMC can be regarded as a social innovation that has the potential to contribute to the implementation of the Lisbon Strategy. OMC is a very useful process to stimulate policy learning. OMC peer-review can be used as a major driving force for reforms.

OMC governance is becoming a crucial point and it will need much more effort in the third cycle. What is needed in the future is a stronger version of OMC to facilitate a stronger commitment from Member States and better support to Member States to help them reach their objectives.

Based on the analysis presented in this report and taking due account of existing and previous OMC groups, the expert group has identified the following areas for future policy learning e.g. in the form of OMC groups or OMC-NETs. This list is only a preliminary one. The final recommendations will be presented in the second report of this expert group.

1. **How to streamline and reform R&D and innovation support systems?** Increasing understanding and appreciation of the complex and dynamic characteristics of innovation processes and the attempt to develop targeted policies and measures to address specific market and systemic failures of European, national and regional innovation systems have over time led into rather complex innovation support systems. This complexity is likely to make innovation support systems ineffective and inefficient. Complexity also makes it more difficult to ensure coherence and complementarity in policy mixes and implies more effort in co-ordination structures. Systemic assessments are therefore rare and difficult exercises. While Member States with more developed innovation

systems will most likely benefit from sharing experiences in this issue, at the same time other Member States can learn to avoid typical problems.

2. **How to improve the involvement of a wider range of stakeholders in the design and implementation of NRPs?** Governance of European, national and regional R&D and innovation policies is becoming increasingly important. Both design and implementation stages of policies are concerned. Trust and long term commitment to shared visions and strategies as well as effective and efficient implementation of policies call for governance processes in which all stakeholders can access and contribute. Most Member States have developed some ways of involving stakeholders but are (or should be) still looking for improvements. This presents an opportunity for sharing experiences and mutual learning.

3. **How to assess the leverage effect of R&D and innovation policy measures?** Public funds should enhance private investments in R&D and innovation. However, there is very limited information available on the true leverage effect of various policy measures. This is mainly due to the fact that there is a lack of good methods and practice for measuring the impact of public interventions.

4. **How can public procurement be used to enhance innovation?** Several Member States are considering, planning or already piloting new policy initiatives aimed at innovative public procurement. Other Member States are perhaps considering it. Public procurement can be a powerful instrument in enhancing innovation. However, it is far from straight forward implementation. The design and implementation of innovative public procurement schemes must overcome several regulatory, governance and even social, political and cultural challenges. This makes innovative public procurement a relevant theme for policy learning and sharing of experiences.

5. **How to make Europe more attractive for investments in R&D and innovation?** As the barriers for mobility are decreasing, the most innovative companies and the best brains are moving globally into locations which are the most conducive for R&D and innovation. R&D and innovation are concentrating into locations that offer the best environment for these activities. It is important that Europe, Member States and regions can improve the attractiveness of their innovation systems for European companies and researchers as well as international companies and researchers. The ERA initiative with the attempt to open up and inter-link national R&D and innovation systems is one of the key policy measures at the European level. Other potential measures include creation of lead markets, creation of global centres of excellence, development of large-scale research facilities and enhancing public-private and/or international mobility. All Member States are faced with the challenges of globalisation of R&D and innovation activities, which makes this a relevant topic for policy learning and coordination.

6. **How to ensure the coherence between national and regional R&D and innovation policies so that Structural Funds would best enhance R&D and innovation?** The main objective of Structural Funds is to enhance cohesion in Europe by stimulating less developed regions

to develop catching-up strategies. As the regions develop and their economic growth, as well as social and environmental development, becomes progressively more innovation-driven, the role of R&D and innovation increases also in the context of Structural Funds. In contrast with past interventions, which focused on basic infrastructure provision, the current role of Structural Funds is increasingly focused on improving innovation capacities in less developed regions. Investments in R&D and innovation and especially in the development of the R&D and innovation systems can have a significant impact on the regions' development and growth capabilities in the longer term. One of the key questions in the context of using Structural Funds to develop R&D and innovation capabilities is coordination of several policies at European, national and regional levels. To identify and establish an optimal role for Structural Funds in the context of European, national and regional R&D and innovation policies can significantly increase the impact of Structural Funds. This presents a relevant topic for learning especially for less developed regions, which have significant Structural Funds at their disposal. On the other hand, policy coordination in the context of Structural Funds is a wider issue covering also national and European policies.

7. **What kinds of policies can be effective in stimulating R&D and innovation in services?** The importance of service innovation is increasing both in manufacturing and services. Traditionally and still today, most R&D and innovation policies and systems have been developed for technological innovation in manufacturing. There is a need to gear existing R&D and innovation policies so that they would better address service innovation. There is also room for more service innovation oriented R&D and innovation policies and policy measures. While many Member States have identified the increasing importance of service innovation, very little concrete policy action has been taken. This is obviously a topic where mutual learning of new policy initiatives and the realignment of existing policies measures to better address service innovation would be likely to enhance the renewal of R&D and innovation policies. This is a topic where both learning and coordination should be addressed both at national and European levels.

8. **How does open innovation change R&D and innovation policies?** R&D and innovation are increasingly collaborative and take place in various types of network arrangements. Networks and collaborative arrangements allow each actor to concentrate on developing their own strengths and competencies. Increasing interdependencies between R&D and innovation actors and the need to speed up innovation processes has led to establishment of various types of more or less open R&D and innovation platforms. Especially multinational corporations have started to open more and more of their research for collaboration, even with competitors. Open R&D and innovation platforms can be physical environments (e.g. campus types of environments or joint research centres and facilities) or virtual networks (e.g. open internet based platforms typical for open source software). This development is well in line with R&D and innovation policy objectives and policies should therefore support it. However, as this development blurs traditional boundaries between companies, universities and research institutes and creates new public-private structures, policies should be adapted accordingly. Adapting existing

R&D and innovation policies and creating new policies and measures to support open R&D and innovation is an area where Member States and regions can benefit from learning and policy coordination activities, especially since many of these open platforms extend over regional and national borders. For this reason, open platforms show a particular potential for achieving ERA objectives. European level policy coordination is also increasingly important since many of the new Framework programme initiatives such as Technology Platforms are important measures to support open R&D and innovation.

Annex 2 presents preliminary ideas for the practical implementation of these 8 topics identified potential for policy learning and coordination.

Sources of information

1. The NRPs submitted by all Member Sates.
2. The evaluation performed by the European Commission to each of them.
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10. Communication from the Commission: More research and innovation: a common approach. COM(2005) 488.
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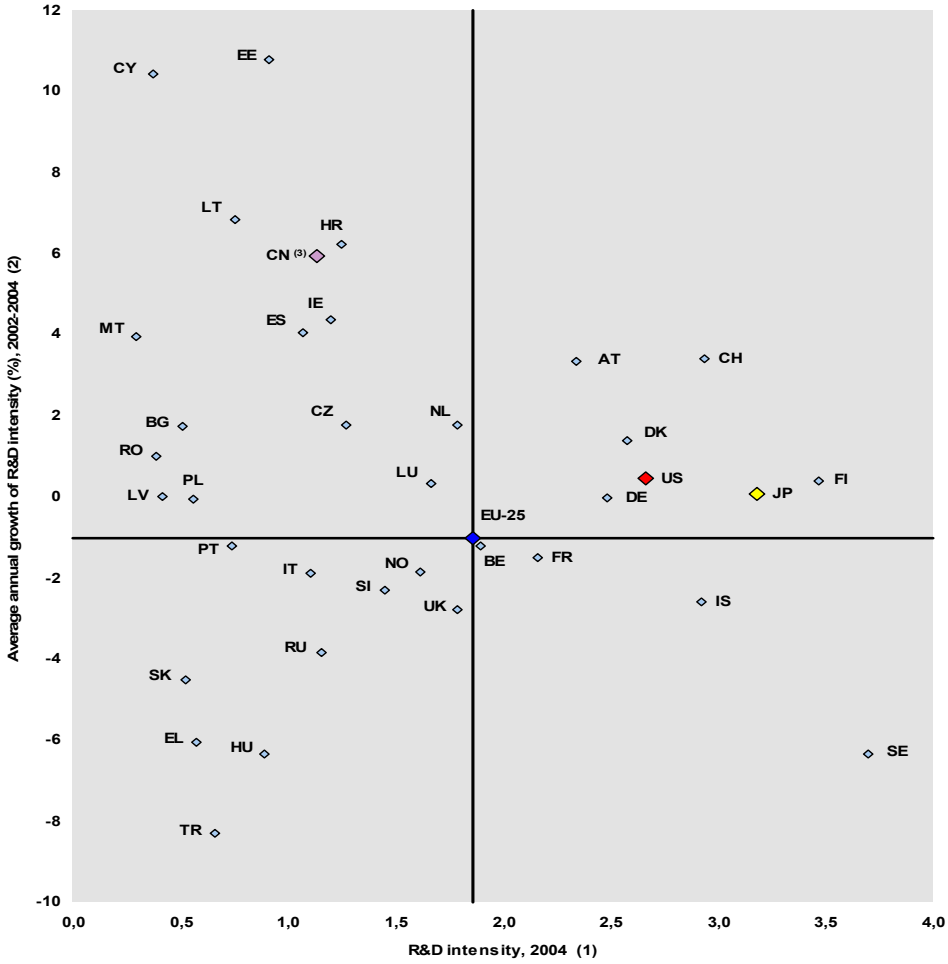
Annex 1 – Clustering of Member States according to their progress towards Lisbon objectives and innovation performance

ART 173 – Report: Recent trends in R&D investment and its private funding

(A draft report provided to the expert group by DG Research)

Figure A1 Progress towards the 3% Objective
R&D intensity, 2004 and average annual growth since 2002



Data: Eurostat, OECD
Notes: (1) TR : 2002; IT, CN : 2003; AT, FI : 2005.
(2) CH : 2000-2004; TR : 2001-2002; IT, CN : 2002-2003; AT, FI : 2002-2005; EL, LU, SE : 2003-2004.
(3) CN : Hong Kong is not included.

Figure A1. Progress towards the 3% objective. R&D intensity 2004 and average annual growth since 2002.

An examination of the individual Member States' pace of progress after 2002 reveals a distinction between four groups of EU countries. A first group consisting of the Nordic countries Finland and Denmark, Austria and Germany are pulling further ahead of the EU average. Especially Austria has been able to progress very substantially over the recent years. France, Belgium and Sweden, which were part of this first group until 2002, experienced a weakening of their growth performance and are now losing

momentum. The trend reversal is particularly significant in the case of Sweden, where the annual R&D intensity growth dropped from +4.7% (1997-2001) to -4.3% (2001-2004). The Southern countries Italy, Portugal, and Greece, as well as the new Member States Hungary and Slovakia, and to a lesser extent the UK, are falling further behind since 2002. Conversely, most of the other new Member States, in particular Cyprus, Estonia and Lithuania, as well as Ireland, Spain, and to a lesser extent The Netherlands and Luxembourg, have been catching up with the EU average over the recent years.

European Innovation Scoreboard: Base Findings

(http://trendchart.cordis.lu/scoreboards/scoreboard2005/executive_summary.cfm)

This is the fifth edition of the *European Innovation Scoreboard* (EIS). The EIS is the instrument developed by the European Commission, under the Lisbon Strategy, to evaluate and compare the innovation performance of the Member States. The EIS 2005 includes innovation indicators and trend analyses for all 25 EU Member States, as well as for Bulgaria, Romania, Turkey, Iceland, Norway, Switzerland, the US and Japan. The list of indicators and the methodology for calculating the Summary Innovation Index (SII) have been revised in close co-operation with the Joint Research Centre (JRC). The revised methodology now captures more dimensions of a country's innovation performance, although ensuring continuity with results of the former EIS editions. The annex includes tables with definitions as well as comprehensive data sheets for every country.

Development of national innovation performances

With respect to the situation in Europe, significant national differences are still observed. Figure A2 shows the Summary Innovation Index (SII) on the vertical axis and the average growth rate of the SII on the horizontal axis. Countries above the horizontal dotted line currently have an innovation performance above the EU25. Countries to the right of the vertical dotted line had a faster than EU25 average increase in the SII.

Based on their SII score and the growth rate of the SII, the European countries can be divided in four groups:

- Switzerland, Finland, Sweden, Denmark and Germany make up the group of "*Leading countries"*.
- France, Luxembourg, Ireland, United Kingdom, Netherlands, Belgium, Austria, Norway, Italy and Iceland all belong to the group of countries showing "*Average performance".*
- Countries "*Catching up"* are Slovenia, Hungary, Portugal, Czech Republic, Lithuania, Latvia, Greece, Cyprus and Malta.
- Countries "*Losing ground"* are Estonia, Spain, Bulgaria, Poland, Slovakia, Romania and Turkey.

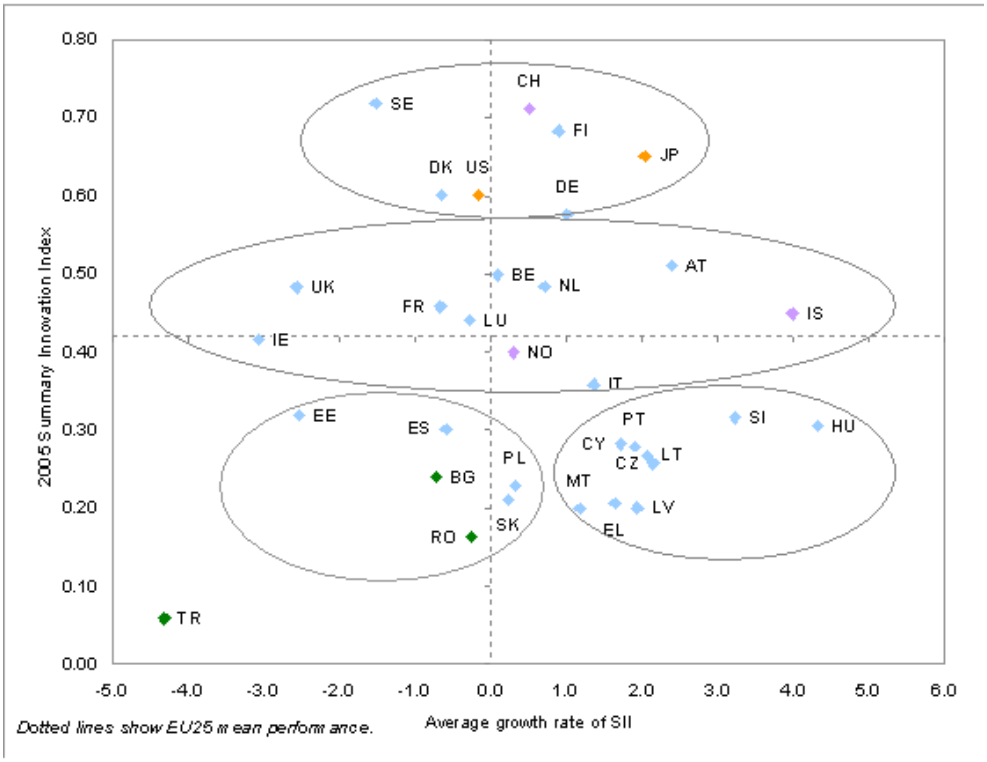
Innovation input and innovation output

One measure of innovation efficiency is the ability of firms to translate innovation inputs into innovation outputs. The ratio between the EIS composite index for inputs (education, investment in innovation, etc) and outputs (firm turnover coming from new products, employment in high tech sectors, patents, etc) provides a measure of this relationship for national innovation systems. The composite indicator for Inputs is computed as the average of the 16 indicators covered in Innovation drivers, Knowledge creation and Innovation & entrepreneurship; the composite indicator for Outputs is computed as the average of the 10 indicators covered in Applications and Intellectual

Property. Table A1 shows the ranking of countries based on their SII scores and the composite indicators for Inputs and Outputs. Finland, Sweden and Switzerland are leading in both Inputs and Outputs. Many countries have similar rankings on both Input and Output performance. The most noteworthy exceptions are Belgium, Iceland, Norway, Estonia, Cyprus, Lithuania and Latvia, which all rank much better on Inputs than on Outputs. Luxembourg, Ireland, Italy, Spain, Czech Republic, Slovakia and Romania all score much better on Outputs. These results should, however, be interpreted very carefully because many of the Output indicators measure intellectual property, where there is an enormous range in performance.

Table A1. Input, output and SII ranks

	SE	CH	FI	DK	DE	AT	BE	UK	NL	FR	IS	LU	IE	NO	IT	EE	SI	HU	ES	CY	PT	LT	CZ	BG	PL	SK	EL	LV	RO
INPUT	1	3	2	5	7	9	6	8	11	12	4	18	17	10	20	13	16	19	22	14	21	15	27	23	25	28	26	24	29
OUTPUT	2	1	3	4	5	7	12	11	8	10	16	6	9	15	13	22	20	18	14	25	21	28	19	26	24	17	27	29	23
SII	1	2	3	4	5	6	7	9	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29



Notes: The circles in Figure A2 identify the four main country groupings: top = leading countries, middle = average performers, bottom right = catching up, and bottom left = losing ground.

Figure A2. SII and trends

Annex 2 – Preliminary ideas about implementing policy learning and coordination

There are a couple of general issues that should be considered in the context of implementing policy learning and coordination activities in an international context. First of all, policy learning and coordination activities should emphasise and thereby enhance the adoption of the truly systemic approach in R&D and innovation policy. Policies and policy measures should be analysed, benchmarked and discussed in the wider context of R&D and innovation policy mix. Sufficient understanding of the specific characteristics of a policy mix in a particular political, social, cultural and economic context is vital in establishing a solid ground for learning.

Secondly, it is important to recognise that policy learning and coordination should take place at all levels of R&D and innovation policy governance as well as between these levels. European, national and regional policies and policy measures should complement each other and establish an effective and efficient mix of policies. Similarly, it is important that all key stakeholders are invited to participate in policy learning and coordination activities. Policy learning and coordination should contribute to the creation and development of the European research and innovation area at all levels.

Thirdly, policy learning and coordination activities should be integrated into existing and renewed R&D and innovation policy governance processes at European, national and regional levels. The OMC can contribute to the development of the European research and innovation area as well as the development and renewal of the national and regional innovation systems best when it is integrated into the governance processes related to the design, implementation and analysis of European, national and regional R&D and innovation policies. Separate policy learning and coordination activities not integrated into existing governance processes tend to remain unattached exercises with little real impact.

With these in mind, the following presents some ideas how policy learning and coordination could be implemented in the context of topics identified by the expert group. The ideas are related to each of the identified topics and are discussed with a structure that first looks into the objectives followed by the potential activities and methods. The discussion then touches the issues of organisation and participation, and finally ends up with some ideas regarding the deliverables of the proposed activities.

Finally, the ideas presented here are described in the view of a broad systemic approach to R&D and innovation. No specific effort is made to differentiate between implementation in a narrower context of research or innovation policy only. However, the general approach described in the following text should apply equally for the broader approach as well as for the narrower approach; with the obvious differences in the emphasis on different stakeholders and their role in the process, and with the fact that some topics suggested are more research and some more innovation oriented.

1. **How to streamline and reform R&D and innovation support systems?**

   Objectives

   The overall objective of addressing this topic is to improve the effectiveness and efficiency of the R&D and innovation support system by eliminating inefficiencies, and enhancing competition and market mechanisms. The aim is

to have a more market oriented, dynamic and agile R&D and innovation support system. The emphasis on establishing competition and market mechanisms is in line with the evolving role of the government. Opening up these systems to the international dimension is another challenge to address.

Activities and methods

Most policy measures addressing the innovation support system are in the form of direct support to service providers to provide subsidised services for R&D and innovation. The lack of coordination between European, national and regional measures has resulted in a complex mix of services being provided by various public, semi-public and private service providers, most of which are living on public funding. Services are typically small and limited and only address some of the needs of R&D and innovation performers, thus making the system fragmented and difficult to approach and use. Furthermore, most measures have insufficient quality control systems and no real customer need orientation. Funding systems are also generally fragmented and there is a lack of understanding on the collective effectiveness of the range of service provided.

The potential approach to establishing policy learning and coordination activities related to this topic could therefore consist of the following elements:

- Analysis and evaluation of innovation support systems with the emphasis on how they address the real needs of R&D and innovation performers, identification of gaps and overlaps, and coordination needs between European, national and regional initiatives. This could be done e.g. in the form of peer reviews at regional and national levels.
- Benchmarking of policy measures targeted to innovation support systems with the emphasis on quality, effectiveness and efficiency and identification of good practices.
- Joint design and implementation of reformed or new policy measures targeting innovation support systems with the emphasis on ensuring the continuous improvement of the quality of innovation services, reducing fragmentation, establishing market mechanisms (e.g. channelling public funds via R&D and innovation performers in the form of direct aid or vouchers) and improving the leverage of public funding, and better coordination. This should also include cross-border initiatives to further improve the effectiveness of innovation support systems and simultaneously support the development of open R&D and innovation platforms and ERIA.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The tasks could include the benchmarking exercise as well as analysing and reporting the results of the regional and national analysis and evaluation projects. This group should have representation from national or regional groups (preferably policy makers) and key experts from benchmarking and national evaluation projects.

- Network of national analysis and evaluation projects/groups possibly co-funded by the Commission. These should focus on the analysis and evaluation of the existing innovation support systems as well as providing recommendations on how to improve them. The representation in these groups should consist of national and regional policy makers, R&D and innovation performers and key experts.
- Voluntary joint design and implementation in the form of INNO-nets or OMC-nets with two levels of governance: one on European level network and another on the national level. Representation in these networks/groups should consist of national and regional policy makers, R&D and innovation performers, innovation service providers, experts and the Commission (European level only).

Deliverables

The deliverables of these policy learning and coordination activities could be:
- Development of cross-border networks and actors providing high quality innovation support services in Europe.
- Identification and reporting of good practices, potentially even guidelines for establishing policy measures targeting innovation support systems.

Some of the more concrete questions addressed could be e.g.:
- How to establish or improve the supply and quality of innovation support services?
- How to address the lack of competence for buying innovation support services among R&D and innovation performers, especially start-up companies?
- How to coordinate European, national and regional initiatives targeting innovation support services?
- How to support the development of service provider networks and bigger service providers into the European research and innovation area?

2. **How to improve the involvement of a wider range of stakeholders in the design and implementation of NRPs?**

Objectives

The overall objective of policy learning and coordination activities under this topic would be to contribute to building awareness, shared commitment and trust among all key stakeholders and thereby ensuring policy coherence. The emphasis is on improving governance processes especially policy design. This topic addresses the increasing importance of R&D and innovation policy governance.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Benchmarking strategic intelligence and policy design processes with the emphasis on transparency, openness and access of stakeholders to these processes. The processes could include e.g. foresight, assessment and policy advice activities. Co-operation with some specialised Commission units (e.g. JRC-IPTS) would also be useful.

- Follow up of improvements to the strategic intelligence and policy design processes with the emphasis on transparency, openness and access of stakeholders. The follow up should focus on the same selected processes targeted in the benchmarking exercise.
- Series of workshops for a wider set of stakeholders with the aim to raise the awareness of R&D and innovation policy governance.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the benchmarking exercise and the series of workshops with the help of national (and regional) groups. This group should also analyse and report the conclusions of the analysis and follow-up activities. This group should have representation from national groups (preferably policy makers and other stakeholders) and key experts from benchmarking and national evaluation projects.
- National (and regional) projects/groups possibly co-funded by the Commission. These should focus on the analysis and evaluation of the existing strategic intelligence and policy design processes as well as providing recommendations on how to improve them. The representation in these groups should consist of national and regional policy makers, R&D and innovation performers, civil society organisations and key experts.
- Network of national (and regional) projects/groups possibly co-funded by the Commission to design and follow-up specific types of strategic intelligence and/or policy design processes during their implementation with the focus on transparency, openness and accessibility. The representation in these networks/groups should consist of national and regional policy makers, R&D and innovation performers, civil society organisations and key experts.

Deliverables

The deliverables of these policy learning and coordination activities could be:

- Raised awareness among a wider set of stakeholders of the relevant policy strategic intelligence and policy design processes and how stakeholders can access them. Increasing trust towards the Commission and national and regional governments and better commitment to commonly defined objectives.
- Identification and reporting good practices, potentially even guidelines for establishing open, transparent and accessible, yet cost effective strategic intelligence and policy design processes.

Some of the more concrete questions addressed could be e.g.:

- How to establish open, transparent and accessible strategic intelligence and policy design processes?
- How to avoid dominance of specific stakeholders? How to combine wide participation and ownership of NRPs with the need for overall coherence?
- How to involve a wide range of stakeholders in a cost effective way?

- How to communicate during the process to build trust and enhance shared commitment?
- How to combine the inputs of stakeholders with knowledge gained from studies and indicators on the national innovation system?

3. **How to assess the leverage effect of R&D and innovation policy measures?**

Objectives

The overall objective related to this topic is ensuring the effectiveness of policies by in-depth understanding of systemic effects of the policy mix. This topic is related to improving the strategic intelligence processes and more specifically evaluation. This topic is related to the increasing importance of R&D and innovation policy governance processes with the emphasis on strategic intelligence.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- A set of collaborative research projects aimed at developing methods and methodologies for evaluating the leverage effect of public policy measures with the emphasis on evaluating the leverage effect of mix of policy measures and evaluating the leverage effect of different kinds of policy measures (e.g. direct and indirect funding, regulatory and structural reforms and various demand side measures like procurement and the use of standards and norms)
- Testing of the developed new methods and methodologies for the evaluation of leverage effect of selected mixes of policies and selected types of policy measures. These projects should be collaborative projects analysing the leverage effect in several Member States and/or regions to allow comparison and verification of the developed methods and methodologies.
- Development of standard state of the art methods and methodologies for evaluating and assessing the leverage effect of mix of policy measures and specific types of policy measures.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise a targeted open call for developing new methods and methodologies. This group should also organise and manage the testing projects and prepare the guidelines for state of the art methods and methodologies for evaluating and assessing the leverage effect of public policies. This group should have representation from national (and regional) policy makers and key experts.
- Research projects developing methods and methodologies for evaluating and assessing the leverage effect of public R&D and innovation policies. This should be done in close connection with socio-

economic research in FP7. The representation in the steering groups of these projects should consist of key experts and national (and regional) policy makers.

- Collaborative testing projects for the developed methodologies in several Member States (and regions). The representation in the steering groups of these projects should consist of national (and regional) policy makers and key experts.

Deliverables

The deliverables of these policy learning and coordination activities could be:

- More developed state of the art and methods and methodologies for evaluating the leverage effect of public R&D and innovation policies with the emphasis on mix of policies and various types of policy measures.
- Better understanding of the real leverage effect of specific types of policy measures in specific types of contexts and the relationship of the leverage effect and coherence of a mix of policy measures leading to better coordinated and more effective mixes of policies.
- Improved state of the art and guidelines (and standards) in evaluation methods and methodologies for evaluating and assessing the true leverage effect of public R&D and innovation policies.

Some of the more concrete questions addressed could be e.g.:

- What combinations of approaches, methods and methodologies could be used to evaluate and assess the leverage effect of public R&D and innovation policy measures?
- Which methods and methodologies are appropriate for evaluating and assessing the leverage effect of specific types of policy measures?
- How to design the evaluation and assessment in a cost effective way?

4. **How can public procurement be used to enhance innovation?**

Objectives

The overall objective related to this topic is to enhance the demand for innovation and thereby speed up the introduction of advanced products and services to the market, and lead this by public sector example. Demand side measures can also be effective in gearing R&D and innovation investments to solve social and environmental challenges. This topic also addresses the increasing importance of market mechanisms as the approach to enhance innovation and focus R&D investments. This topic is related to the evolving role of government.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Exchange of experiences of policy initiatives established to enhance innovative public procurement of R&D and innovation.
- Development of guidelines and good practices for innovative public procurement with the aim to help public sector organisations to develop their competencies and to engage in innovative procurement.

- Voluntary joint collaborative schemes for enhancing innovative public procurement.
- Assessment of modifications of general or specific regulations related to public procurement at the European and national level.
- Series of national and European workshops aimed at public sector organisations to raise the awareness of innovative public procurement.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the exchange of experiences, series of European level workshops and the preparation of guidelines and collection of good practices. The group should also coordinate and facilitate the national level workshops. This group should also analyse and report the progress made in Europe in implementing innovative public procurement schemes. This group should have representation of national (and regional) policy makers, public sector organisations, consultants and key experts.
- A separate project to prepare the guidelines and collect good practices related to innovative public procurement. This project should also analyse and follow up the state of the art globally. The project should be funded by the Commission. The project should be carried out by experts and steered by a group consisting of Commission representatives, national policy makers, public sector organisations and consultants (that could help public sector organisations engage in innovative public procurement).
- Voluntary joint design and implementation of innovative public procurement schemes in the form of INNO-nets or OMC-nets with two levels of governance: one on European level network and another on the national level. Representation in these networks/groups should consist of national and regional policy makers, public sector organisations, consultants, experts and the Commission (European level only).

Deliverables

The deliverables of these policy learning and coordination activities could be:

- Raised awareness among public sector organisations of the potential benefits (e.g. productivity and quality) of innovative public procurement.
- Improved competencies among public sector organisations for innovative public procurement.
- Guidelines and good practices for public sector organisations helping them to engage in innovative public procurement.
- Creation of lead markets for public sector oriented/motivated innovations in Europe.

Some of the more concrete questions addressed could be e.g.:

- How to design innovative procurement schemes in pre-competitive and competitive stages?

- How to design targeted innovative procurement schemes in the context of public procurement and State aid regulations?
- How to encourage public sector organisations to take risks?
- How to develop the competencies of public sector organisations to define future needs for the basis of innovative procurement?
- How to facilitate the development of private consultancy services to help public sector define and implement innovative procurement?
- How to use innovative public procurement to develop lead markets?
- How to assess and evaluate the impact of innovative public procurement schemes?
- How to reconcile a focus on national capacities with the need to open up to foreign expertise?
- How to identify the right sectors where public procurement could have more effect in boosting innovation?

5. **How to make Europe more attractive for investments in R&D and innovation?**

Objectives

The overall objective related to this topic is improving the attractiveness of the European research and innovation area by improving market dynamics, creating lead markets, creating global centres of excellence and enhancing mobility. The aim is to bring more dynamics into the European R&D and innovation systems. This is strongly related to the aim to enhance a truly systemic approach in R&D and innovation policy by designing coherent and challenge oriented mixes of R&D and innovation policies.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Analysis and benchmarking of the attractiveness of European R&D and innovation systems with the emphasis on regulatory and other systemic barriers as well as on identifying good practices. Comparisons and benchmarking with non-European practices.
- Analysis of the role and behaviour of multi-national companies and their associated decision-making processes in locating R&D activities.
- Developing and testing new methods such as back-casting (starting from a desired future scenario, identify what action would have to be taken to eventually achieve it) for the design of mixes of policies aiming to improve the attractiveness of R&D and innovation systems. The emphasis should be on systemic approach and policy coherence (incl. internal/common markets).
- Voluntary joint collaborative schemes aiming to improve market dynamics, create lead markets, enhance mobility and establish global centres or networks of excellence.
- Series of workshops for policy makers, experts and R&D and innovation performers with the aim to identify and discuss the necessary policy actions on European, national and regional levels.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the analysis and benchmarking exercise, the series of workshops and the development and testing of new methods for policy design. This group should also follow up the developments in Europe. This group should have representation of national (and regional) policy makers, the Commission, R&D and innovation performers and key experts.
- A collaborative analysis and benchmarking project to identify regulatory and other systemic barriers for improving the attractiveness of the European innovation systems. The project should also identify good practices and develop a set of indicators to monitor the attractiveness of innovation systems. It should rely on comparisons with practices and results achieved in other parts of the world.
- Research projects developing methods and methodologies such as back-casting for the design of coherent challenge oriented mixes of R&D and innovation policies. The representation in the steering groups of these projects should consist of key experts and national (and regional) policy makers.
- Collaborative projects for testing the developed policy design methodologies in several Member States (and regions) with the emphasis on improving creating lead markets, enhancing mobility and creating global centres of excellence. The representation in the steering groups of these projects should consist of national (and regional) policy makers and key experts.
- Networks of national and regional actors possibly co-funded by the Commission to exchange experiences and follow-up specific policy measures aiming to improve the attractiveness of innovation systems. The representation in these networks should consist of national and regional policy makers, R&D and innovation performers and experts.

Deliverables

The deliverables of these policy learning and coordination activities could be:

- Improved attractiveness of European innovation systems leading to increasing R&D and innovation investments in Europe.
- More systemic approaches and methods in designing challenge oriented/motivated coherent mixes of policies.
- Identification and reporting good practices.

Some of the more concrete questions addressed could be e.g.:

- How to increase foreign direct investment in R&D in Europe beyond the present (low) level?
- How to raise attractiveness of Europe for globally mobile talent?
- What can be done beyond intra-national initiatives?
- What is the potential of intra-European inter-country activities?
- How can a systemic and strategic coordination of national research policies and related initiatives help to stimulate new and increased public and private research activities?

- What kinds of structural reforms would be necessary, including EU-wide regulatory changes (e.g. in field of research labour force mobility)?
- Is there room for inter-country policy design towards the stimulation of lead markets?

6. How to ensure the coherence between national and regional R&D and innovation policies so that Structural Funds would best enhance R&D and innovation?

Objectives

The overall objective in the context of this topic is to assess the coherence of European, national and regional level policies as well as coordination between cohesion and R&D and innovation policy objectives. The aim is to identify the appropriate role of Structural Funds in creating and developing sustainable competencies and structures that will allow less developed regions to catch up and move towards the knowledge economy and innovation driven growth.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Benchmarking the use of Structural Funds for R&D and innovation in the regions with the emphasis on identifying good practices and potential barriers for creating a more sustainable impact on the development of regional R&D and innovation systems.
- Analysis and evaluation of the role and impact of Structural Funds in R&D and innovation system development including identification of appropriate impact evaluation approaches and methods.
- Analysis of the role of Structural Funds in the context of European, national and regional R&D and innovation policies with the emphasis on identifying the appropriate role for Structural Funds and the relevant needs and methods for policy coordination at the regional level and between European, national and regional levels.
- Voluntary cross-regional joint projects to enhance the use of Structural Funds for developing the R&D and innovation systems.
- Series of workshops for regional policy makers with the aim to distribute good practices in using Structural Funds for the development of regional innovation systems.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the benchmarking exercise, analysis of the role of Structural Funds and the relevant coordination needs, development of the impact evaluation approaches and methods and the series of workshops with the help of regional groups. This group should also analyse and report the conclusions of the voluntary joint activities. This group should have representation from regional groups and key

experts from benchmarking and analysis projects as well as national and European policy makers.

- A collaborative analysis and benchmarking project to identify good practices in the use of Structural Funds for R&D and innovation and its relationship with the Framework Programme. This project should be commissioned to experts and steered by a group consisting of regional, national and European policy makers and experts.
- A collaborative project to analyse and evaluate the impact of Structural Funds on the long term development of regional R&D and innovation systems. The analysis should focus on identifying appropriate evaluation approaches and methods, using these in evaluating the impact and providing recommendations for both impact evaluation approaches and methods and future use of Structural Funds. The project should also identify the role of Structural Funds and the needs to enhance coordination between cohesion and R&D and innovation policy objectives on the one hand and coordination between European, national and regional policies on the other. This project should be commissioned to experts and steered by a group consisting of regional, national and European policy makers and experts.
- Network of national (and regional) projects/groups possibly co-funded by the Commission to design and follow-up joint cross-border initiatives during their implementation. The representation in these networks/groups should consist of regional policy makers, R&D and innovation performers and experts.

Deliverables

The deliverables of these policy learning and coordination activities could be:

- Better coordination between European, national and regional R&D and innovation as well as cohesion policies leading to a more effective and efficient use of Structural Funds for R&D and innovation.
- Identification and dissemination of good practices in the use of Structural Funds for the long term development of regional R&D and innovation systems.
- Appropriate approaches and methods for the evaluation of the impact of Structural Funds in the context of R&D and innovation and cohesion policies.

Some of the more concrete questions addressed could be e.g.:

- How to identify and establish the appropriate and balanced role for the use of Structural Funds with respect to both R&D and innovation and cohesion policy objectives?
- How to evaluate the impact of Structural Funds on the long term development of the regional R&D and innovation systems?
- How to coordinate European, national and regional R&D and innovation policies at the regional level?
- How to combine better the use of Structural funds with FP7 in the period 2007-2013?

7. **What kinds of policies can be effective in stimulating R&D in services?**

Objectives

The overall objective under this topic is to enhance innovation in services. This emphasises the alignment of existing and the creation of new R&D and innovation policies to address service innovation. This topic also addresses the importance the systemic approach, since the role of market demand is dominant in service innovation.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Exchange of experiences and identification of good practices of policy initiatives established or aligned to enhance service innovation.
- Analysis of appropriate mixes of policies aimed at enhancing service innovation with the emphasis on the specific characteristics of service innovation in general and in specific sectors.
- Voluntary joint collaborative schemes for enhancing service innovation.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the exchange of experiences, collection of good practices and analysis of appropriate policy mixes. This group should also analyse and report the progress made in Europe in implementing schemes designed or aligned to enhance service innovation. This group should have representation of national (and regional) policy makers, service R&D and innovation performers and experts.
- A separate project to analyse the specific characteristics and appropriate mixes of policies targeting service innovation. This project should also analyse and follow up the state of the art globally. It could include a dimension on indicators to measure innovation in services. The project should be funded by the Commission. The project should be carried out by experts and steered by a group consisting of Commission representatives, national policy makers, service R&D and innovation performers and experts.
- Voluntary joint design and implementation of schemes designed or aligned to enhance service innovation in the form of INNO-nets or OMC-nets with two levels of governance: one on European level network and another on the national level. Representation in these networks/groups should consist of national and regional policy makers, service R&D and innovation performers, experts and the Commission (European level only).

Deliverables

The deliverables of these policy learning and coordination activities could be:

- R&D and innovation policies and policy measures better designed and aligned to the specific needs of service innovation leading to the development of innovative and more globally competitive services in Europe as well as improved productivity and faster growth of services.
- Identification and reporting of good practices for mixes of policies aimed at enhancing service R&D and innovation.
- More in-depth understanding of the specific characteristics of R&D and innovation in services, and development of indicators for measuring achievements, paying also attention to the specificities of service generation and deployment in different sectors (e.g. health, transports, communications, etc.).

Some of the more concrete questions addressed could be e.g.:

- What are the specific characteristics and barriers of R&D and innovation in services?
- How to design and align policies to better address R&D and innovation in services?
- How to design mixes of policies addressing the sector specific needs of R&D and innovation in services?
- How to enhance the development of R&D and innovation culture in services?

8. **How does open innovation change R&D and innovation policies?**

Objectives

The overall objective related to this topic is to establish R&D and innovation policies to enhance open innovation and thereby improve the transfer, sharing and use of knowledge and skills within and between innovation systems. The aim is to support the development of open platforms and other collaborative and network arrangements with enhanced public-private interaction and mobility.

Activities and methods

The potential approach to establishing policy learning and coordination activities related to this topic could consist of the following elements:

- Exchanging experiences related to the creation of open R&D and innovation platforms, collaborative and network arrangements with the emphasis on enhanced public-private interaction and mobility.
- Analysis and evaluation of the impact of open innovation on the productivity and results of R&D and innovation with the emphasis on transfer and use of knowledge and skills, IPR and contractual, structural and other aspect of open arrangements. The analysis should also identify barriers as well as good practices in establishing open R&D and innovation arrangements.
- Series of studies combined with workshops focusing on specific aspects of open innovation such as mobility, IPR, transfer and use of knowledge and skills, governance processes and appropriate policies to support the development of open innovation platforms, collaborative and network arrangements on European, national and regional levels.

Organisation

Policy learning and coordination activities related to this topic could be organised in the following way:

- European level OMC group for coordination of activities under this topic. The group should organise the exchange of experiences and the series of combined studies and workshops. This group should also analyse and report the results of the combined studies and workshops as well as monitor the development of open R&D and innovation in Europe. This group should have representation of national and regional policy makers, R&D and innovation performers and experts.
- A collaborative project to analyse the impact of open innovation on the R&D and innovation performance as well as the appropriateness of mixes of policies supporting open innovation. The project should be commissioned to experts and steered by a group consisting of European, national and regional policy makers, R&D and innovation performers and experts.
- A series of combined studies and workshops commissioned to experts and supported by networks of experts, policy makers and R&D and innovation performers organised around each specific topic.
- There is little need to establish separate European level coordination or policy learning activities, since the Framework programmes include several open innovation related initiatives. The appropriate policy learning and coordination activities should therefore be integrated into appropriate Framework programme activities.

Deliverables

The deliverables of these policy learning and coordination activities could be:

- Developing globally leading open innovation platforms, collaborative and network arrangements in Europe, and through these increase the attractiveness of Europe with respect to R&D and innovation investments.
- Remove regulatory, structural and other institutional barriers for open innovation and align R&D and innovation policies to better support the development and utilisation of open innovation arrangements.
- Identification and dissemination of good practices in the support and development of open innovation arrangements.

Some of the more concrete questions addressed could be e.g.:

- What are the regulatory, structural and other institutional barriers for open innovation and how could they be removed?
- How to deal with IPR in the context of open innovation?
- How to deal with pensions, mobility, employment and other labour market issues in the context of open innovation?
- What could be the advanced forms of public-private partnerships in the context of open innovation and how they could be established?
- How to evaluate the impact of open innovation on the R&D and innovation performance?