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Executive Summary

This report forms the outcome of a series of mini studies undertaken in the context of the INNO Learning Platform. They are intended to provide input and an analytical base to support a more informed discussion of the issues that will feed into the drafting of a Commission Green Paper in October 2008. This report, Mini-study 1, is intended to contribute to pressing discussions on the efficiency of innovation support measures by starting to perform a comprehensive mapping of such measures in Europe. It builds on the results from the INNO-Policy Trendchart, which already documents the existing innovation support mechanisms in Europe but adds information on their features, trends and administrative costs, thus contributing to a quantitative assessment of the budgetary implications of innovation support. The study also provides an overview on which are the most common mechanisms used in support of innovation in Europe and which budgets are allocated to them. The goal is to contribute to a better definition of the policy rationale for public innovation support mechanisms in Europe, with the final objective of increasing their impact and reducing their administrative burden. The study is not intended to provide a set of closed answers or prescriptive recommendations for action, although a set of conclusions have been derived.

The mini study relies strongly on the experience and products of the INNO-Policy TrendChart initiative of DG Enterprise and Industry, on with wider experience of the activities of parallel projects, together with additional inputs from the wider innovation literature and from the results of a direct survey of the Pro-INNO TrendChart Network of National Correspondents.

It begins with a consideration of how to define innovation support measures, taking a discussion of the definition of innovation policy itself as a starting point. The study notes that, in the governance context, in a number of countries there has been a shift in the way in which innovation policy is viewed towards an integrative, holistic integration of formerly separate policy areas. A range of existing definitions of innovation policy are briefly reviewed before discussing the limits of the policy instruments that may be applied to support innovation, given this broadening of the innovation policy remit. This discussion covers the difficulties experienced in previous exercises in developing a workable definition of innovation policy support measures. Such definitions are strongly determined by the targets, mechanisms and desired effects of the instruments in question.

The issue is then approached from the ‘bottom-up’ with the aim of investigating criteria that might encompass all possible innovation support measures. This entails discussion of a number of taxonomies into which innovation policy instruments might be placed, in an ex post manner, and which ensures that the entire range of innovation support measures within the policy portfolio may be captured.

The next section examines past trends in the types of innovation support prevalent across the Member States (and beyond), largely through an analysis of TrendChart data. The problems encountered with categorising innovation support measures again arise, in conjunction with the difficulty of identifying the relative policy importance of different areas of support within the overall national policy mix. Simple counts of measures or types of measure also fail to quantify the notion of ‘importance’ in terms of focus areas of support. Notwithstanding these problems, the TrendChart data reveal a number of trends in priority areas for innovation support from the early 2000s, while results from the recent survey of TrendChart correspondents reveal a set of more recent shifts in the focus of innovation support, often in response to contextual drivers, such as identified policy demand and as a recognition to gaps in the policy mix. The final part of the section then responds to more targeted enquiries into the question of whether a bias in innovation support towards technological innovation still exists and what has been done to address this bias, again largely by reference to evidence collected within TrendChart activities. It is clear that there is
still a tendency for innovation support to focus on technological forms of innovation, although there is also a shift towards greater support for non-technological innovation, and a number of examples of such programmes are provided.

The next section focuses on more recent and emerging developments in the ways in which innovation may be supported and is largely based on the survey data previously described. Firstly, a number of new and novel forms of innovation support are identified and specific illustrative examples provided, including innovation support in specific problem areas, the targeting of companies with high innovation growth potential, efforts to streamline measures and, as discussed above, support for non-technological innovation. Examples of measures transferred between countries, such as the Dutch Innovation Vouchers, support for FP participation and measures to stimulate public procurement from SMEs are also given. The second part of the section briefly deals with a number of examples of new approaches towards innovation support.

The final analytical section examines the issue of expenditure on innovation support, commencing with an exploration of the key issues and concerns. These largely focus on the costs of innovation support measures and their level of return to the economy, and on the costs of delivering innovation support. For several reasons, such as the problem of identifying a ‘typical’ measure, or that of defining ‘innovation support’, the relationship between costs and efficiency is not easily defined. The discussion examines these reasons briefly, before focusing on the issue of internal administrative procedures and costs. Again, various problems concerning definitional issues and the difficulty of obtaining comparative and comprehensive information emerge, but some insights are provided from personal views and from existing studies on the implementation of the EU Structural Funds and from a specific UK support instrument. The final part of this section examines the issue of the external administrative costs to participants, firstly as a potential barrier to participation in innovation support schemes and secondly in the context of policy efforts to reduce the administrative costs of measures. Evidence was found both to support the view that such costs do indeed act as a barrier to participation and of examples of efforts to mitigate this barrier.

Lastly, a set of brief conclusions are presented, some of which are accompanied by recommendations for potential Commission action in the future.
1 Introduction

1.1 Background

Support to innovation is one of Europe’s top priorities and concerns all its Member States. Nevertheless, although innovation performance in Europe is tentatively converging, great differences still exist between the most dynamic countries in this regard and those who are following or catching up. There is a need to accelerate catch-up processes in Europe by improving the efficiency of the national innovation systems and better and more efficient innovation support mechanisms are urgently needed to faster transform research into new products and services.

Although Member States have made good progress in improving the efficiency of their innovation systems, much more still needs to be done at all levels. As part of the Lisbon Strategy, and in line with the objectives of the new Lisbon Treaty, most Member States have in recent years, undertaken great efforts to further improve their innovation support mechanisms by new investments in infrastructure and in implementing new or better instruments. Further major improvements are expected in the coming years, including through the Structural Funds, which are planned to be increasingly used for innovation capacity building. As a result, a great number of measures currently exist to directly or indirectly support innovation in Europe, including measures supporting technology transfer, incubation, access to finance, etc. The INNO-Policy TrendChart\(^1\) currently identifies more than 400 horizontal and specific measures in support of innovation. These measures play a key role in helping organisations to innovate better and faster, by addressing specific market and system failures hindering European companies, and in particular SMEs, to fully exploit their innovation potential. However, in order to accelerate the catch-up processes in Europe, it is important that lessons are learnt from such measures, in particular as regards their effectiveness.

The European Innovation Scoreboard (EIS) 2007\(^2\) introduced the somewhat provocative concept of ‘innovation efficiency’ in order to measure how innovation inputs are transformed into innovation outputs. Although innovation is not a linear process where inputs automatically transfer into outputs, the EIS considers that it is worthwhile to examine differences in efficiency by assuming that efficiency can be defined as the ratio of outputs over inputs. This analysis showed high variations in innovation efficiencies across the EU, suggesting that most Member States have scope to achieve greater innovation outputs based on their current inputs, if they can address the inefficiencies of their systems.

It is a fact that despite its enormous potential impact on strengthening innovation performance in Europe, relatively little attention is still paid to innovation policy efficiency, i.e. the effectiveness of the results achieved in return for the investment made in implementing them. The debate is concentrating more on ‘what’ should be supported rather than on ‘why’ and ‘how’. This raises the risk that higher investments in RTD and innovation capacity building may not trigger the expected impact on innovation. At the same time, innovation support should be delivered more effectively, thus also potentially reducing administrative burdens for innovative enterprises (and implementing agencies).

The present study will further contribute to this pressing discussion on the efficiency of innovation support measures by starting to perform a comprehensive mapping of such measures in Europe. This will build on the results from the INNO-Policy TrendChart which already documents the existing innovation support mechanisms in Europe, but will add information on their features, trends – e.g. towards a more integrated, pro-active and

\(^{1}\) http://www.proinno-europe.eu/trendchart

customised services provision, mechanisms for promoting service innovation – and administrative costs, thus contributing to a quantitative assessment of the budgetary implications of innovation support. The study should, in particular, provide a quick overview on which are the most common mechanisms used in support of innovation in Europe and which budgets are allocated to them.

It is clear that the Best practice model available in one country, which is instantly ready for implementation in others, does not really exist. However, it is obvious that an improvement in efficiency can be facilitated by the extensive use of tested good practice examples from other, more advanced countries and that a mapping of such measures is a first step in such a direction. The goal is to make a contribution to a better definition of the policy rationale for public innovation support mechanisms in Europe, with the final objective of increasing their impact and reducing their administrative burden.

As a final point, it should be noted that the perceived role of this study is to contribute towards a more informed discussion of the issues, which will contribute to the drafting of a Commission Green Paper or a Staff Working Document to be published in the second half of 2008. It is not intended to provide a set of closed answers or prescriptive recommendations for action.

1.2 Methodology

As noted above, this mini study has relied strongly on the experience and products of the INNO-Policy TrendChart initiative of DG Enterprise and Industry, together with wider experience of the activities of parallel projects. Additional inputs from the wider innovation literature have also been used although, due to the limited resources of this study, the authors have attempted to focus on a narrow set of the most relevant inputs.

One of the authors has been involved with the activities of the INNO-Policy TrendChart since its inception and with its precursor also, the European Innovation Monitoring System (EIMS). The development of the TrendChart has provoked significant discussion on two of the themes considered by this study, namely the definition of innovation policy support measures and approaches towards their characterisation under a range of typologies. This experience has been used to inform the relevant sections of this report.

In addition, a number of TrendChart outputs have been reviewed, in particular, to determine trends in innovation policy support. While the TrendChart database carries information on over 400 innovation support measures, this information has not been systematically exploited for the purposes of this study, mainly as it was not felt to be entirely relevant to the specific tasks covered by this study and also because opportunities to obtain more focused information were offered through a direct survey of the Pro-INNO TrendChart Network of National Correspondents.

The survey was intended as a general input to the full set of mini-studies undertaken in the context of this INNO-Learning Platform exercise and involved the design of a questionnaire based on a number of specific issues proposed by the Commission services. In the specific context of this mini-study, the questionnaire sought information on the following issues:

Understanding the rationale, scope and financial implications of existing support mechanisms

- Recent shifts in the form or emphasis of innovation support (such as from direct R&D support to firms towards tax credits or towards indirect ‘soft’ measures).
Emerging trends and future challenges in support of innovation

- New or novel types of innovation support measures being implemented or planned, including new measures based on those used in other countries.
- New approaches to the support for innovation, such as new governance structures and practices, or new operating practices that better address the needs of innovative SMEs.

Administrative costs of innovation support

- Administration costs as a perceived barrier to participation
- Increasing the efficiency of innovation support delivery

The questionnaire received responses from the countries noted below. All EU Member States provided responses. The authors gratefully acknowledge the inputs of the TrendChart Network of National Correspondents.

Austria  Czech Republic  Iceland  Luxembourg  Malta  Slovenia  Spain  Sweden  Switzerland  Turkey  UK  USA  Russia
Belgium  Denmark  India  Malta
Brazil  Estonia  Ireland  Netherlands  Switzerland
Bulgaria  Finland  Israel  Norway  Poland
Canada  France  Italy  Portugal
China  Germany  Japan  Romania
Croatia  Greece  Latvia  Slovakia
Cyprus  Hungary  Lithuania*  USA

Note: Orange highlight indicates no response.
2 Towards a definition of innovation support measures

2.1 What is innovation policy?

Clearly, in its simplest sense, an innovation support measure must be defined as a policy instrument designed to support the process of innovation, at the national regional or other level. However, this raises the issue of how governments actually define the range of policies that deal with innovation. In turn, this has major implications for the governance of innovation policy.

Over recent years, there has been a consistent shift in the way in which innovation policy is viewed. At a simplistic level, this has resulted in a convergence of the previously separate domains of S&T and industrial policy into a more coherent innovation policy perspective. For example, in Denmark, there have been clear moves towards the integration of policy areas. A series of reforms and initiatives in the Danish system have aimed to create institutional changes and governance structures that are better suited for the coordination of, and cooperation between, the different actors of the national innovation system. A consequence has been that overall responsibility for both R&D policy and innovation policy has become concentrated under the Ministry of Science, Technology and Innovation, with the result that practically all innovation related policies have been allocated to this ministry: effectively, R&D policy thus falls within the broader definition of innovation policy. Changes to the ministerial structure in May 2006 have also meant that greater emphasis has been placed on the stronger integration of research and innovation.

Similarly, the UK government applies a broad definition of innovation, which encompasses not only technology-based innovation, but also innovation in terms of management practices, service provision, business models, etc. Such a definition covers many of the innovations that occur in the service sector and does not restrict itself to the more usual technology-based innovations found in the manufacturing sector. Furthermore, Science and Technology and R&D policy concerns are embedded within innovation policy, thus a broad range of stakeholder views, from both within Government and outside it (from the private, public and not-for-profit sectors) are taken into consideration during the formulation of innovation policy. For several years, overall responsibility for innovation policy was vested with a lead government ministry, the Department for Trade and Industry. The DTI exhibited strong leadership in innovation policy matters and equally strong efforts to coordinate innovation policy-making at the inter-ministerial level. Concentrating leadership for innovation policies in a single ministry, backed up by strategic intelligence, was felt to offer a major opportunity to fuse the ‘R’ and the ‘D’ in R&D policies into innovation policies. However, in July 2007, the DTI was replaced and many of its functions, including responsibilities for science and innovation, were transferred to a new Department for Innovation, Universities and Skills (DIUS). The new Department also has responsibility for further and higher education and skills, previously part of the remit of the Department for Education and Skills. DIUS also works closely with the new Department for Business, Enterprise and Regulatory Reform (BERR), which assumed other functions of the former DTI. Thus, again innovation policy covers a broader set of policy portfolios.

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3 Siune, K. and Aagaard, K., Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: The “POLICY MIX” Project: The Danish R&D Governance Model, European Commission, January 2008.

4 Cunningham, P.N., Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: The “POLICY MIX” Project: Thematic Report: Governance, European Commission, January 2008.
Finally, at the regional level similar considerations may be identified. The Flemish Community’s policy places an emphasis on innovation as a horizontal policy goal and the relevant authorities do not articulate an ‘R&D’ policy, but rather an innovation policy as a driver of regional competitiveness. Key priorities are: building a strong knowledge base in the public sector, the valorisation of this base in outcomes relevant to societal needs, entrepreneurship promotion, creation of critical masses in technology and innovation, and more recently, rationalisation of public support and evaluation of public programmes and actions. The socio-economic development plan for Flanders ‘Flanders in action’ (July 2006) has, as a top priority, ‘creativity, innovation culture and entrepreneurship’, whilst the underlying concept of ‘open innovation’ influences policy priorities. An important focus is placed on the objective of developing human resources, whilst the provision of adequate financial resources for innovative companies is another new direction that can be identified. Although fostering R&D is part of this priority, the main accent is on creativity and entrepreneurship, and innovation in the broader sense (including innovation in services and in the public sector)\(^5\).

In order to adopt a pragmatic approach, the SYSTEMATIC Report\(^6\) notes that innovation policy is commonly defined as ‘a set of policy actions to raise the quantity and efficiency of innovation activities whereby innovation activities refer to the creation, adaptation and adoption of new or improved products, processes or services’.

Reid and Peter identify an operational distinction used to further clarify the definitional difference between science and innovation policy; that ‘innovation policy focuses on all types of innovation activities and processes in enterprises (at all stages in their development from a business idea to a mature firm seeking to renew its product range, etc.) and not only on R&D or technological innovation’. Thus, under this definition, the final beneficiaries or targets of innovation policy are, first and foremost, enterprises (together with entrepreneurs seeking to set up an enterprise), although the authors note that, increasingly, actors from the not for profit and public sectors may also form the targets of innovation policy.

In the context of a systems perspective of innovation, however, such a definition is too narrow. As is clearly discernible from the range of policy activities presented in the European TrendChart on Innovation policy monitoring initiative\(^7\), innovation policy encompasses not only instruments targeting the firm or entrepreneurs but also ‘indirect beneficiaries’ (although the rationale for the use of the adjective ‘indirect’ is not clear). These include ‘financial organisations (seed capital funds, etc), innovation and business support services, cluster management partnerships, knowledge transfer structures in universities, public research organisations, etc.’ Reid and Peter note that innovation policy may be further differentiated from science policy in that it aims explicitly to support non-technological innovation and other authors have attempted to characterise innovation in a systemic way\(^8\).

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5 Nauwelaers, C., Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: The “POLICY MIX” Project: Region Case study: Flanders, European Commission, January 2008


7 http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=52&parentID=52

8 For instance, Halvorsen et al (2005) provide a very broad typology of innovations:
1) **innovations involving changes in characteristics and design of service products and production processes** – including development, use and adaptation of relevant technologies,
2) **delivery innovations** – involving new or altered ways of solving tasks, delivering services or otherwise interacting with clients for the purpose of supplying specific services,
3) **administrative and organisational innovations** – involving new or altered ways of organising activities within the supplier organisation.
4) **conceptual innovations** – in the sense of introducing new missions, new worldviews, objectives, strategies and rationales.
2.2 Innovation support measures as instruments of innovation policy

The evolution of a broader, more comprehensive view of innovation policy clearly expands the boundaries of the policy instruments that may be applied to support innovation. Whether governments take the view that innovation policies are designed to address market failures or systemic failures, the shift in policy from an industry-oriented perspective has consequences for the range of policy tools that may be applied. In its most basic interpretation, we would thus anticipate a shift from measures that aim to directly support R&D in businesses (for example, to counteract risk aversion) to a broader policy toolkit which addresses R&D in the public sector and the transfer of knowledge generated therein, to the private sector and to attempts to improve the general milieu for innovative activities. This potential shift will be examined in Section 4.

To return to the issue of what constitutes an innovation support measure, it is worth noting that this topic has formed a point of discussion within the TrendChart initiative for several years. Indeed, given the central remit of the project to collect and organise information on innovation support measures, such a definition would be assumed to be critical in delimiting the boundaries of the project’s information collection activities.

A very basic definition applied in the TrendChart from early days was that an innovation policy measure is any policy instrument and policy mechanism that affects the innovation process – wherever it occurs. Effectively, this removes the implicit link between innovation activities and industry (particularly, manufacturing). Although recent events concerning the development of the ERAWATCH activity have necessitated a split between policies targeting enterprises and those that affect the public sector, in terms of the broad based definition of innovation described above, this separation is deemed to be somewhat artificial.

Three forms of innovation policy measures/mechanisms may be identified based on the types of resources employed:

- financial, human and organisational resources - deployed through or on behalf of innovation-oriented programmes and projects;
- the provision of new information (vision, strategy, coordination, best practice) which is geared towards innovation activities;
- new institutions (legal acts, rules) designed to explicitly affect the innovation process.

A further categorisation of innovation support measures can be based on their intended effects, which may be:

- **Explicit**, i.e. those measures that explicitly state the enhancement of the innovation process as their objective; and
- **Implicit** i.e. measures that affect innovation process indirectly (and are not designed with innovation objectives in mind but, nevertheless, have unintended and significant consequences on the innovation process)

After some deliberation, the following broad definition of an innovation policy measure was proposed:

> "an innovation policy measure is any activity that mobilises: resources (finance, human resources, organisations), information (road-mapping, technology diffusion activities, best practice dissemination) and formal and informal institutional processes (legal and regulatory) to achieve" 

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5) system interaction innovations - new or improved ways of interacting with other organisations and knowledge bases. See: Halvorsen, T., Hauknes, J., Miles, I. and Røste, R., On the differences between public and private sector innovation, PUBLIN project report D9, NIFU-STEP, Oslo, 2005

public policy objectives in the area of innovation. It will do this with some percentage of public funds. Finally, it will predominantly be for the benefit of enterprises'.

The latter condition was introduced for the pragmatic purpose of limiting the scope of the Trend Chart information collection processes, but does not necessarily fit within the scope of the broader definition of innovation described above. For example, it excludes innovation within public bodies and agencies, which can be supported through public policies and funds.

A more recent, and succinct working definition is quoted by Reid and Peter (2008): ‘an innovation policy measure can be defined as any action taken or (co-) financed by the public sector with the aim of influencing innovation processes and capacities in enterprises’. Under this definition, they identify four main types of policy action:

- Provision of financial resources (State Aid) directly to enterprises to support one or more elements of the innovation process in enterprises;
- Provision of financial resources to organisations providing innovation-related services to enterprises or acting as intermediaries in the innovation system (between the research system and enterprises, financial intermediaries, etc.);
- Creating, diffusing and coordinating exchange of knowledge amongst the actors in the innovation system, notably by improving the governance of the system (by public authorities, public-private partnerships, etc.).
- Creation of new institutions (legal acts, regulations, rules) designed to explicitly influence innovation processes in enterprises (these can be specifically aimed at enterprises such as administrative simplification or indirectly for instance through establishing a legal framework for venture capital providers).

2.3 Typologies of innovation support

In an effort to approach the issue of definition ‘from the bottom-up’ as it were, and with the aim of developing a set of criteria that might encompass all possible innovation support measures, the TrendChart discussions attempted to frame various taxonomies into which such policy instruments might be placed. These attributes included:

1. the type of measure (e.g. legal, financial, informational, organisational, etc.);
2. the objectives specified (based on whether the objective is the improvement of absorptive capacity; generation of new knowledge; diffusion and networking; stimulation of demand; coordination of activities);
3. the operational level (regional; national; EU; international)
4. areas of application (sectors; technologies)
5. type of employed resources (financial; information; legal; coordination)
6. participants - eligible organisations (R&D organisations; enterprises active in R&D – large, SMEs; technologically competent enterprises; enterprises with minimal capabilities; SMEs in traditional technologies, public agencies and laboratories, universities, RTOs, etc.)
7. beneficiaries (R&D organisations; enterprises active in R&D – large enterprises, SMEs; technologically competent enterprises; enterprises with minimal capabilities; SMEs in traditional technologies; individuals, public agencies and laboratories, universities, RTOs, etc.)
8. administrators (ministries, public agencies, NGOs)
9. stage of innovation process promoted (R&D; training; physical investment; design; tooling; marketing, etc.)

10. performance (assessing effectiveness): 'hard indicators' and expert assessment

11. effects (assessing impact): ‘hard indicators’ & expert assessment

Such taxonomies may be applied *ex post* (rather than *ex ante*), which thus sidesteps the need to arrive at fully comprehensive definition or, at least, improves the chances of ‘capturing’ the entire range of innovation support measures that exist within the policy portfolio.

Alternatively, measures can be categorised according to their modality of operation or their targets. Modality of operation is concerned with how measures are implemented, whether through the provision of direct financial and/or structural support, and through the generation and/or transfer of knowledge. The following table shows how the principal mechanisms for the provision of support relate to aspects of the innovation system

<table>
<thead>
<tr>
<th>Modality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D funds</td>
<td>Provide direct support for innovative activity.</td>
</tr>
<tr>
<td>Legal framework</td>
<td>The laws and regulations bearing on innovation</td>
</tr>
<tr>
<td>Tax &amp; Financial Incentives</td>
<td>The provision of financial benefits to encourage innovative activity</td>
</tr>
<tr>
<td>Coordination &amp; Transparency</td>
<td>These relate to the ways in which innovation related policy measures are formulated and implemented, and the steps taken to improve efficiency and effectiveness, and clarity.</td>
</tr>
<tr>
<td>Infrastructural Development</td>
<td>Activities such as the establishment of dedicated intermediary organisations to facilitate technology transfer, and which complement other structural modalities.</td>
</tr>
<tr>
<td>The Mobility of Personnel</td>
<td>Mechanisms to encourage individuals to work, frequently on a temporary basis, within other organisations, with a resulting exchange of knowledge and information.</td>
</tr>
<tr>
<td>Transfer &amp; Exploitation of Research Results</td>
<td>Mechanisms to diffuse and support the application of research in innovation.</td>
</tr>
<tr>
<td>Information Diffusion</td>
<td>Mechanisms aimed at more general awareness of scientific and technological opportunities, and of related support schemes.</td>
</tr>
<tr>
<td>Demonstrator Projects</td>
<td>A more direct mechanism to diffuse and promote the adoption of innovations.</td>
</tr>
<tr>
<td>Networks &amp; Clusters</td>
<td>The establishment and development of inter-organisational pathways used in the transfer of knowledge.</td>
</tr>
</tbody>
</table>

The targets of policy mechanisms are the organisational types and levels at which policy mechanisms are aimed. These range from individual researchers, through institutions, to groups of related organisations, such as clusters sectors and regions. More specifically, the following table shows how targets can be categorised.

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<table>
<thead>
<tr>
<th>Target</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researchers &amp; young scientists</td>
<td>Specific mobility and training schemes.</td>
</tr>
<tr>
<td>Universities &amp; Research institutes</td>
<td>Play key roles in the generation of new knowledge, the training of researchers, and in the launch of new technology based firms.</td>
</tr>
<tr>
<td>SMEs</td>
<td>A priority across the Member States, requiring support for their innovative activities, both in the diffusion and absorption of new knowledge.</td>
</tr>
<tr>
<td>Large Companies</td>
<td>Targeted because of their R&amp;D activities and their frequently influential roles in particular sectors.</td>
</tr>
<tr>
<td>Sectors</td>
<td>Particularly those closely identifiable with specific technological priorities, embrace a range of organisation types, which can play complementary roles.</td>
</tr>
<tr>
<td>Regions</td>
<td>In a number of case, the targets of more general policy mechanisms, to which innovative activities may contribute.</td>
</tr>
</tbody>
</table>

An early taxonomy developed under Trend Chart (and influenced by the European Commission’s 'First Action Plan for Innovation in Europe' in 1996) is given in Annex I.

Several of these categories of measure extend beyond the enterprise-oriented definition presented above. For example, measures in category I (Fostering an innovation culture) address education and training (both inside and outside of the firm), mobility of researcher and students, public administrations and society in general, whilst III.1 (Strategic vision of research and development) addresses approaches such as foresight, which may be adopted by public agencies. However, the remaining measures are strongly oriented towards the support of innovation in firms or between firms and other actors/knowledge producers in the innovation system.

A revised version of this policy categorisation was produced for the period 2005-2007 (prior to a further re-organisation in order to incorporate measures and programmes covered by the ERAWATCH activity – see below). This version is again more industry-centred, covering measures directed at, or for the benefit of, firms (see Annex II).

Most recently, and as noted above, a further revised version of the categorisation of policy measures has been produced. This was designed with the intention of producing a single over-arching and comprehensive framework under which policy measures for both the research domain (collected under DG RTD’s ERAWATCH initiative) and the innovation domain (collected under DG Enterprise and Industry’s TrendChart initiative) could be co-located. The typology is presented in Annex III.

Clearly, the fact that research policies can form a significant element within broader innovation policies, coupled with diversity in the breadth of the definition of innovation policies encountered between countries, agencies and actors across Europe and beyond, leads to further complexity within the typology of measures. It also further extends the boundaries beyond the simple industry-oriented definition proposed in Section 2.2.

One final example of a typology is that employed in the SYSTEMATIC survey. Here, the types of innovation policy measures were simplified to:

- Cluster initiatives
- Technology platforms

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- Innovation programmes
- Regulation (legal initiative, technical norm, etc.)
- Competition regulation (regulation on prices, patents, etc.)
- Quality regulation (labelling green public procurement, etc.)
- Fiscal incentive (subsidies, tax benefits, green/eco tax, etc.)
3 Major features of innovation support

3.1 Past trends – analysis of TrendChart data

3.1.1 Background

A series of Annual Synthesis Reports is available from the European TrendChart on Innovation. From these reports, it is possible to identify some broad trends in the development of innovation support. However, a precise mapping is difficult due to two reasons: 1) the changes in the innovation policy categories used, documented above (Section 2.3); and 2) the problem of identifying innovation policy priority areas. The latter point requires further explanation. While the categorisation of measures provides a means of identifying specific areas of innovation policy, the relative policy importance of these areas, within the overall national policy mix, is harder to identify. A simplistic count of the number of measures within each sub-category does not suffice. This is because, even within sub-categories, measures vary in their nature, targets, budgetary size, cost to implement and a range of other factors. In addition, some measures may relate to a single large programme whilst others may be more restricted instruments within a larger package of support.

The Annual Synthesis Reports offer an overview of national innovation policy priorities and changes over the relevant reporting periods. The process for defining these priorities was as follows: the country correspondents could allocate a total of forty points across all of the action lines in accordance with their perceptions of national priorities. As the report emphasises:

‘these priorities... aim simply to convey a sense of which Action Lines are viewed as of current importance in terms of national policy formulation, and to reflect the relative amounts of ‘effort' dedicated to them. In this context, the term effort embraces funding and other resources, government statements of intent or interest, publicity and more general rhetoric. Thus new or emerging policy areas are not necessarily priorities, although over time, these priority tables should reflect the growth or decline in importance of policy areas. Similarly, a low relative priority score does not necessarily imply that a particular Action Line is considered to be unimportant, rather that measures in this area may already be sufficiently well developed, requiring little policy attention.’

Thus, the priority tables were recognised as being highly subjective, representing only relative importance. National correspondents were recommended to solicit the views of a number of policy experts and policy makers in constructing the policy priorities tables. An example of the policy priority table from the 2003 Annual Synthesis Report is presented in Annex IV.

3.1.2 Evident trends

In the 2000 Annual Synthesis Report (Boden, 2001) it was reported that, for the EU-15 plus Norway, the action lines categorised under the broad headings of ‘Gearing research to innovation' and ‘Financing of innovation' (see Annex 1 for a more detailed explanation)

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15 In 2000, only incomplete data was available for the Central and Eastern European countries. Data for Cyprus, Iceland, Israel and Lichtenstein was unavailable.
tended to be of greatest importance. Within the sub-categories, in terms of the level of policy attention, the top five categories of measures were those aimed at:

1. Intensified co-operation between research, universities & companies
2. Financing of innovation
3. Start-up of technology-based companies
4. Promotion of clustering and co-operation for innovation
5. Strengthening the ability of SMEs to absorb technologies and know-how
6. Strengthening research carried out by companies

In the 2003 Annual Synthesis Report\textsuperscript{16}, the following general findings were identified:

- 'A high degree of variation in the levels of priority accorded to the different Action Lines, both within and between countries.
- A tendency for innovation policy priorities to be focused within the area of 'gearing research to innovation' with least priority given to 'fostering an innovation culture', in both the EU Member States and Associate States (EU15\textsuperscript{+17}), and the Accession Countries.
- In the EU15+, innovation policy 'hot-spots' exist with regard to the start-up of technology-based companies and intensified cooperation between the science base and industry. Other areas of policy focus include financing of innovation and strengthening of research carried out by companies.
- In the Accession Countries, a major innovation policy hot-spot exists in the area of strengthening the ability of SMEs to absorb technologies and know-how. Relative importance is also accorded to a 'Strategic vision of R&D' and only then do start-up of technology-based companies and intensified cooperation with industry, research and universities emerge as priorities. Education and initial and further training also form a relatively high priority area.'

The 2003 Annual Synthesis Report also drew some comparisons with the 2000 policy priorities outlined above. It noted the following major trends\textsuperscript{18}:

**EU 15+**

- 'A recent slight decline in the priority of promotion of clustering and cooperation for innovation.
- A fairly strong relative increase in the priority given to the area of 'protection of IPR'.
- A slight increase in the priority of the 'legal and regulatory environment', possibly linked to the priority accorded to IPR issues.
- Longer-term declines in the priority of financing of innovation, intensified cooperation between research and industry and in strengthening the ability of SMEs to absorb technologies and know-how. However, all these areas remain at above average priority.'

**Accession Countries:**

- A slight increase in the priority of education and initial and further training
- A relatively consistent increase in the priority of financing of innovation


\textsuperscript{17} For the purposes of this report defined as the EU Member States plus the Associate Countries of Norway, Iceland and Israel.

\textsuperscript{18} Due to nature of the construction of the policy priority tables, negative trends may imply both a 'real' diminution in priority and a passive decline due to shifts of priority to other areas.
In general terms, the following action lines demonstrated an increase in perceived priority between 2000 and 2003 across the EU-15+:
- Education & Training (slight)
- Mobility of students, researchers and teachers (slight)
- Protection of IPR (strong)
- Administrative simplification (very slight)
- Legal and regulatory environment (very slight)
- Taxation (strong, but variable)
- Start-up of technology-based companies (very slight)

For the Accession Countries, the following Action Lines exhibited increases:
- Education & Training
- Innovation and management of enterprises
- Competition
- Legal and regulatory environment
- Financing of innovation (strong)
- Taxation
- Strategic vision of research and development (strong)
- Strengthening research carried out by companies (very strong)
- Start-up of technology-based companies (slight)

3.1.3 Recent shifts
Unfortunately, although of questionable methodological robustness, the priority tables were discontinued after 2003, thus, longer-term evidence on trends is not available. However, a recent exercise undertaken in the context of Trend Chart support to the INNO-Policy Learning Platform activity was designed to investigate recent trends in innovation support.

Amongst other questions, a survey of Trend Chart National Correspondents posed the question: ‘Has there been a shift in the form or emphasis of innovation support in your country over the last five years?’

The results gave a general indication is that, in some countries, there have indeed been some significant shifts in the emphasis of innovation support. However, it is worth noting that any shifts that have occurred have tended to be in response to contextual drivers, such as identified policy demand and as a recognition to gaps in the policy mix.

In broad terms, two shifts can be detected: The development of a different policy mix of measures and innovation support instruments, and a shift in the emphasis or focus of these measures.

With regard to the emergence of new policy mixes, there is some apparent evidence of:

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19 Although this remained at a very high level of relative importance and may have been an artefact of the extremely high scores accorded to the Action Line in the early stages of the project.
• greater emphasis on tax credits or other fiscal incentives, often alongside R&D grants rather than as a replacement (Austria, Belgium, Czech Republic, France, Greece, Hungary, Italy, Malta, Poland, Slovenia, Brazil, Japan, Norway, Romania, Sweden (potentially));
• increased emphasis on cluster policies, competence poles and research centres (Belgium, France, Germany, Luxembourg, Norway, Sweden);
• increased use of valorisation instruments, such as soft loans and other financing mechanisms (Belgium, France);
• more emphasis on indirect measures, ‘soft’ measure and regulatory frameworks (Austria, Estonia, Lithuania, Slovenia, Sweden);
• greater attention to demand side measures, such as innovation procurement (Malta, Portugal);
• supporting excellence in the Higher Education sector (as a source of human capital for the innovation system) (Germany, Ireland, Lithuania, Luxembourg);
• the use of packages of assistance support or ‘mini-mixes’ (Netherlands);
• the use of R&D or innovation vouchers (Netherlands, Portugal).

With regard to the second shift, that of the emphasis of innovation support, there has been a tendency towards:
• direct funding streams have shifted from a sectoral focus to thematic foci (Austria, Italy, Netherlands, Israel) …
• …but also from a horizontal to a sectoral focus (Hungary, Italy);
• more emphasis on innovation support directed at societal goals rather than industrial bottlenecks (Finland, Netherlands, Japan);
• an increasing emphasis on support for non-R&D based, non-technological innovation, and the services sector (Finland, Sweden) – see also below (Section 3.1.4);
• a greater focus on the regional dimensions of innovation systems (France);
• more targeted support to SMEs (and high tech, high potential value SMEs) (France, Germany, Denmark).

Some of the new (and not quite so new) Member States have undergone some policy shifts in compliance with the Lisbon reforms, in particular:
• Developing an increasing sophistication in the policy mix – from direct R&D subsidies to capital and other forms of funding (Cyprus, Lithuania, Poland)
• An increasing emphasis on innovation concerns rather than supporting R&D (Cyprus, Latvia, Lithuania, Luxembourg, Malta, Poland, Slovenia)
• Increases in the amount of direct funding for R&D, often using EU Structural Funds as a major source of finance (Czech Republic, Latvia)
• A shift from loans to grants for innovation support (Hungary)

However, several of the non-EU Member States and non-EU countries are in a position of catching up or have innovation policy systems that are still too young for the initial mix to have changed significantly (Brazil, Romania, Bulgaria, Croatia).

The tendency for a shift from an R&D policy orientation to an innovation orientation has also been taken further in some countries by the adoption of a more holistic approach towards innovation policy-making, often referring to the need to address societal issues and globalisation concerns (Denmark, Finland, Iceland, UK and Norway).
3.1.4 Innovation support and potential technological bias

In the light of discussion on an early presentation of the initial results of this study, further information was sought regarding the questions of whether there is still a bias in innovation support towards technological innovation (as opposed to other forms of innovation) and, if so, what has been done to address this bias.

Evidence on this specific issue has been sought in the context of two studies carried out under the Trend Chart initiative, in 2006\textsuperscript{20} and in 2007\textsuperscript{21}.

The first study, conducted in 2006, found the following:

- 'In general, most innovation support measures appear to be of a horizontal nature (i.e. open to both manufacturing and service companies), although there is frequently a manufacturing or technology bias (which may be a consequence of the national industry structure). However, the number of specific service-oriented measures appears to be growing.

- Only a handful of countries report specific examples of services-oriented innovation support measures. These are Finland, Italy, Portugal, Cyprus, the Czech Republic, and Norway. Several other countries note that some horizontal measures explicitly include service companies, including Austria, Belgium, Germany, Luxemburg, Malta, Spain, Iceland and Turkey.

- Specific services-oriented support measures target industries such as building and construction; healthcare; leisure and tourism; logistics and transport, frequently as a consequence of the role that such industries play in the national economy.

- Relatively few agencies appear to monitor or assess the uptake or distribution of innovation support measures on a sectoral basis, including uptake by service sector firms. These include Germany, Italy, the Netherlands, Spain, Sweden (with quite detailed figures), Cyprus, Lithuania and Slovenia.'

The main conclusions from the later, updated study were the following:

- 'An increase in the numbers or prevalence of policy documents that pay attention to the importance of services in the economy; many of these tend to underline the significance of the service sector in the economy, whilst the absence of specific measures for the support of innovation in services is highlighted (with plans to address such gaps being declared).

- Evidence of a major policy need to develop a better understanding of the nature and significance of innovation within the service sector.

- An increase in the number of countries addressing the issue of innovation in services within policy documents.

- An increase in the level of policy debate surrounding innovation in services and a growth in the number of specific studies into the issue.

- Most countries now operate innovation support measures that are ostensibly sector-neutral.

- Moderate growth in the number of countries reporting specific examples of services-oriented innovation support measures.

- Within service sector-oriented support measures, there is a focus on the ICT/software area (particularly on the uptake of IT), with other measures targeting services in building & construction; healthcare; leisure and tourism; logistics, transport and


infrastructures. There has also been an increase in support and policy attention for the creative industries sector.

- The structure of the national economy plays a major role in determining the degree of sectoral focus of such measures.
- A large number of cluster policies are currently, or will be, in operation, which specifically target, or are open to participation by, service sector companies. Many of these are operated at the state or regional level, or even at the local municipality level.
- Few countries reported specific measures aimed at Knowledge Intensive Business Sectors.
- Several support measures for the promotion of organisational innovation were reported, split between the private and the public sector (notably Government). The major focus was on the uptake of IT services and ICT.

Specific examples of programmes targeting non-technological innovation (i.e. organisational innovation) in the 2007 study22 are:

- The Austrian ‘departure experts’ programme. This is tailored towards the management problems of SMEs in the creative industries and offers profound expert know-how for the implementation of a specific project, i.e. the programme offers management know-how to entrepreneurs and thus also enables organisational innovation.
- In Wallonia, Belgium, at least two measures exist for supporting e-business: BE_93 Wallonia: Grant for the creation of an e-business website; and BE_94 Wallonia: Grant for using the services of a consultant to integrate e-business in SMEs (RENTIC premium).
- The Swiss ‘INNOTOUR’ programme which includes a component of organisational innovation as part of the entire promotion programme. In addition, the ‘e-cademyCH’ contains elements of organisational innovation (promotion of E-Business in firms, etc.).
- The German programme ‘Innovation With Services’ offers funding for R&D related to innovation management, and has a focus on R&D related to the role or people in services.
- Tekes, the Finnish Funding Agency for Technology and Innovation, has recently launched new programmes specifically targeting the development of services. An essential feature is that the development of technology and business competence is advanced in an integrated manner. For example,
  - Serve – an Innovative Services Technology Programme (2006 to 2010) aims to increase and broaden the services development of Finnish industry and to promote academic research in service-related areas. Innovative service concepts and internationally competitive business models renew and strengthen the Finnish economy.
  - The Tourism and Leisure Services R&D programme, launched in late 2006, concentrates on encouraging R&D activities by companies producing leisure services. Development focuses on new service concepts, new ways of producing services and the creation of new spatial concepts, such as those utilising virtual technology.
  - The new Finnish programmes targeting service innovation are based on a view that despite the growing importance of services in the economy, the innovation systems and policies have not so far adequately encouraged innovation in service industries. In addition, there is an identified need to look for new innovative ways to tackle the challenges faced by public services and to address predicted changes in the division of service production between

the public and private sector service providers. As part of these efforts to improve the productivity and the quality of services, there is also an identified need for systematic research and service development tools and processes for the service sector as well as for manufacturing industries. Many of these programmes do not exclude the aspect of organisational innovation in services; indeed, new ways to organise service provision is often an intrinsic component of new innovative solutions. ELO, the e-business logistics programme, which ran from 2002-2005, is a good example.

- Luxembourg supports an awareness programme on Innovation management techniques, which is open to all sectors and not just services.

A further example is provided in Box 4 of the following section.

Thus, there appears to be some evidence that a shift is occurring with regard to policies supporting non-technological forms of innovation in the context of a focus on the services sector. This supports the general findings of the survey of Trend Chart Correspondents in which a shift towards non-technological innovation support was noted. However, there still seems to be a strong focus on services sector which have a high technology component (such as Knowledge Intensive Business Services or KIBS) or which extensively use (or could benefit from greater use of) ICT. Moreover, the efforts made by several countries in developing a greater understanding of the role of R&D in the services sectors also tend to support the idea that innovation support is still often considered to have a strong technological component.

Nevertheless, there does seem to be an observed (although quantitatively unsubstantiated) trend towards greater support for non-technological innovation (such as the dissemination of best practice in organisational innovation, for example), particularly targeted at SMEs. Further analysis of this is beyond the resources of this study, but is recommended.
4 Emerging trends in support of innovation

This section focuses on more recent and emerging developments in the ways in which innovation may be supported. While the forgoing sections have considered innovation support either in the rather narrow context of innovation support measures or instruments, or in the broad sense of policy objectives, it is clear that the way in which such support is formulated and delivered, and the way in which its impact is assessed, may also have major consequences for its effectiveness.

Clearly, a comprehensive review of emerging trends in innovation support and a search for new forms of innovation support would require extensive resource outlays. However, again in the context of recent Trend Chart support to the INNO-Policy Learning Platform activity, two lines of enquiry were undertaken, which provide some information on this topic. The first of these examined new and novel forms of innovation support, whilst the second looked at new approaches towards innovation support.

4.1 New and novel forms of innovation support

The survey of Trend Chart National Correspondents contained the question:

‘In your country, are there any new or novel types of innovation support measure that are being implemented or that are planned for implementation, including new measures based on those used in other countries (the potential use of the Dutch Innovation Vouchers forms one example)?’

The responses contained several examples of new and novel types of innovation support or transfer. These included:

- ‘Eco’ or sustainability-oriented support programmes (Austria (see Box 1), Malta)
- Innovation vouchers (Denmark, Ireland, Netherlands)
- Public-private venture capital fund (Croatia)
- Support for patenting activities (Czech Republic)
- Support for innovative, but ‘risky’ SME projects (Netherlands)
- More targeted support to young companies with high innovation potential (Denmark, Finland (see Box 2), France, Norway)
- Overall reform of the industrial incentives system (Italy), streamlining of innovation policies (Netherlands (see Box 3))
- Inclusion of support for non-technological innovation (Spain – see Box 4)
- Innovative procurement support (Sweden)

Box 1: Austrian climate and energy fund

In 2007, the climate and energy fund (Klima und Energiefonds) was launched in Austria.

This is a programme comprising three policy lines: R&D in sustainable technology fields, promotion of projects improving the public transport system and eco-friendly goods transport, as well as projects to support the diffusion of sustainable energy technologies. The total budget amounts to €500 million (2007-2010). About a third of the €50 million was assigned to R&D in 2007. The programme itself is rather innovative, since it takes a broad approach on different levels that considers both technology creation and diffusion23.

23 For more information see (in German): http://www.klimafonds.gv.at/
Tekes, the Finnish Funding Agency for Technology and innovation is currently reforming its instruments of funding. In connection with this, it is revamping its funding targeted at young, innovative companies and its funding of the development of pre-incubator and incubator activities.

The new funding instrument for young growth oriented companies has been available since the beginning of February 2008. The aim is to provide the most promising young companies an opportunity to develop their businesses in a comprehensive way, as well as grow and internationalise their activities faster than in general. The idea is to provide funding for the accepted growth oriented young companies for a longer time, provided that they fulfil the requirements set for advancement to a following stage (in its full extent total funding per company can reach €1 million, but only in later phases).

Small companies registered in Finland and less than five years old can apply for the new funding, if they have an innovative, knowledge or technology intensive business idea and convincing plans for implementation. The funding is aimed at business ideas with significant potential. When applying for funding the company should be a maximum of five years old. A significant personal investment in R&D is another criteria. A company can apply for the new funding instrument only once. If the company fails to reach the set targets, it will not be eligible for further rounds of funding built into the new instrument. The funding ends either when the company is eight years old or if it grows beyond the size of an SME.

In the Netherlands, following the renewal of the innovation policy instruments in 2005/2006 (with the introduction of two streamlined ‘packages’: a generic package and a programmatic package), few new innovation support measures have been introduced. However, there are some approaches which are somewhat novel, one of which – the innovation vouchers (see later) – has been copied by other Member States.

The ‘programmatic package’ is aimed at specific ‘key areas’ (areas that are strategically important for the Dutch economy). In these ‘key areas’, stakeholders can take the lead in developing their own innovation programmes (bottom-up, interactive, facilitated by the ministry of Economic Affairs and its agency SenterNovem). These programmes are ‘mini-mixes’ and include a range of instruments, from R&D support to SME support.

One of the relatively recent measures introduced in Spain is somewhat novel in its inclusion of non-technological innovation:

InnoEmpresa Programme 2007-2013, which aims at increasing the innovative capacity of enterprises, takes an integral approach covering technological and entrepreneurial innovation. The programme provides grants for innovation projects, (in production organisation, marketing and sales management, environmental management, energy efficiency, logistics, distribution and design); technological advice through support institutions (e.g. technology centres); support for the complementation and certification of technological quality standards; and joint innovation projects between value chain partners (e.g. ICT, logistics).

The InnoEmpresa programme also includes an action line forming part of the AVANZ@ Plan to increase ICT use in internal and external business processes. InnoEmpresa is part of the Plan for Entrepreneurial Promotion, and focuses on organisational innovation and advance management; technological innovation and quality; consortia for innovation projects and incorporation of information and communication technologies. InnoEmpresa is oriented towards the promotion of innovation activities in coordination with the Autonomous Communities and is co-financed by the Structural Funds (FEDER).
Examples of measures transferred from other countries included:

- The use of innovation (or R&D) vouchers (modelled on the Dutch initiative) by Austria, Cyprus (planned), Denmark, Germany (Baden-Württemberg), Ireland, Poland (planned), Portugal (See Box 5).
- Estonia’s technology investment support, based on practices from the Manufacturing Advisory Service (UK) and the Productivity Improvement Fund (Ireland).
- Luxembourg’s Fit4 Europe (based on schemes in Belgium and Austria) and Malta’s FP7 Exploratory Award (See Box 6).
- The Netherlands’ Small Business Innovation Research programme, based on the UK model (in turn, drawn from the US scheme) (See Box 6).
- The Slovenian technology platforms (based on the European Technology Platforms).
- Several new measures in the Greek Competitiveness and Entrepreneurship Operational Programme are inspired by initiatives from other countries.
- Several new Slovakian measures are based on those developed in Belgium, France, Israel, the UK and Sweden.
- Lithuanian ‘Science, Study and Business Valleys’ (based on various international examples).

**Box 5: Innovation vouchers – a popular idea?**

The Dutch Innovation Vouchers scheme was designed as a simple and accessible scheme for SMEs. The vouchers are intended to lower the threshold for companies to purchase know-how. SMEs can use the vouchers to buy expertise from public knowledge institutions, as well as some private institutions. In 2006, approximately €22.5 million was available for support under the scheme. An evaluation of the scheme was due to begin at the end of 2006. Currently, the Ministry of Economic Affairs is providing a more streamlined package of schemes from which entrepreneurs can buy in information and advice. In this regard, the successful approach of the innovation vouchers – whereby entrepreneurs can determine themselves where they purchase information – is likely to become increasingly popular.

The popularity of innovation vouchers is not restricted to the Netherlands:

Using the Dutch model as an example, Austria has also implemented innovation vouchers; the ‘Innovations-Scheck’ aims to assist SMEs in undertaking continuous R&D and thus increase the number of R&D-conducting SMEs. Collaborations between SMEs and research institutes are promoted by amounts of up to €5,000. In Germany, the State of Baden-Württemberg introduced a new measure in 2007, which is ‘linked to the Dutch Innovation Voucher programme’. A 2004 regional innovation audit in the BMW region of Ireland proposed the use of innovation vouchers to encourage SMEs to take up development and technical advice. After a pilot phase, they have been launched nationally by Enterprise Ireland. Finally, Portugal, as part of a shift in its innovation support from the supply to the demand side, has launched its own ‘R&D Vouchers’ scheme.

Similarly, there are a number of future intentions. Cyprus intends to set up its own system of innovation vouchers, where it is anticipated that the scheme will assist SMEs by financing innovation advisory services and facilitate knowledge and technology transfer from research institutions. Denmark, too, is introducing ‘Vouchers’ which will allow SMEs (with no former experience of cooperation with knowledge institutions) to obtain knowledge and expertise free of charge. Poland is also planning to introduce innovation vouchers and fiscal incentives (modelled on the Dutch Promotion of Research and Development Act) for entrepreneurs to allow the employment of providers of R&D services.

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24 For more information see (in German): http://www.bmwa.gv.at/BMWA/Schwerpunkte/Wirtschaftspolitik/Innovatechnol/Innovation/09_innovationsscheck
Box 6: Support for Framework Programme participation

Luxembourg is implementing a new and important set of measures. At the end of 2007, the Ministry of the Economy and Foreign Trade announced the creation of a financing scheme ‘Fit4Europe’ already implemented in other countries (Belgium, for instance) consisting of financial support (a grant) for the preparation costs of a FP7 proposal. The amount received depends on the nature of the participation (participant or coordinator) and the results of a proposal assessment (grants can range from €2,500 to €20,000). ‘Fit 4 Europe’ is part of a more global scheme, ‘Alliance for innovation’ which will also include another financing scheme foreseen for 2008 - the financial support for external expertise in innovation and for the recruitment of innovation assistants (this measure is already implemented in Austria).

Box 7: US to the UK and the Netherlands

The SBIR programme (Small Business Innovation Research Programme) is a US programme in which the government contracts out innovative research with a societal relevance to SMEs. In the US, government departments are expected to spend a fixed percentage of their R&D budgets with innovative SMEs. SBIR consists of three phases: feasibility, development and commercialisation. Multiple companies can submit proposals for phase 1 and phase 2 and the best proposals are selected. The first two phases are 100% funded by the government. The SBIR programme has operated for over twenty years in the US and can be considered an example of good practice.

The UK launched its version of the SBIR, the Small Business Research Initiative (SBRI), in 2001. As in the US model, the SBRI is designed to help SMEs gain greater access to publicly funded R&D contracts. It does not give grants, but does provide an alert service about government procurement opportunities via a dedicated website. SBRI aims to: provide opportunities to those existing small firms whose businesses are based upon providing R&D - by increasing the size of the market; encourage other smaller businesses to increase their R&D capabilities and capacity - to exploit the new market opportunities; and create opportunities for starting new technology-based or knowledge-based businesses. The Department for Innovation Universities & Skills is responsible for co-ordinating SBRI. The target is to procure £78 million of research from small businesses. SBRI is monitoring government departmental compliance with the mandatory target for participating Government Departments to procure at least 2.5% of their extra-mural R&D from small firms. The Government comfortably exceeded its target in 2004-05 and 10.6% of the £2.5 billion (£3.7 billion) of extra-mural R&D expenditure in participating Government departments went to SMEs.

The UK Research Councils, although not Government Departments, are also supporting a specific Small Business Research (SBR) scheme that recognises the specific nature of Research Council funding. The Research Councils have committed to spending at least 2.5% of a baseline on funding university researchers collaborating with SMEs. The baseline comprises responsive and directed grant funding (funding for Research Council Institutes, training, capital expenditure and international subscriptions will be excluded from the baseline).

The Netherlands launched a pilot of SBIR at the end of 2004. This followed the US model. The objective of the Dutch SBIR pilot was to assess how the US SBIR programme could be implemented in the Netherlands in an effective way. The field of ElectroMagnetic Power Technology was selected as a testing ground for the first Dutch SBIR pilot. The Dutch government had already funded strategic basic research in this field at universities via the Innovation-Oriented Research Programme (IOP). The pilot was open to all SMEs in the EU. By issuing R&D contracts directly to SMEs, the government encourages them to innovate and in turn secures solutions for social problems. The Ministry of Economic Affairs launched new pilots in mid-2005 in collaboration with other ministries. An interdepartmental working group was established to further elaborate the SBIR concept in 2006 and all ministries studied opportunities to set up SBIR-pilots themselves. After several pilots, the government decided in 2007 to launch a national SBIR scheme in 2008.
4.2 New approaches towards innovation support
The question upon which the following answers are based was: 'Are other new approaches to the support for innovation being introduced? This could include new governance structures and practices (such as new forms of evaluation practice, new types of implementation agency, etc.), or new operating practices that better address the needs of innovative SMEs (such as clusters of policy measures or 'mini-mixes', public-private partnerships, innovation vouchers, etc.).'

New approaches to the support for innovation included the following examples:

- Improved coordination of innovation governance and implementation structures (Cyprus, Finland, Greece, Hungary, Iceland, Italy, Latvia, Malta, Poland, Romania, Slovakia)
- Increased stakeholder involvement in innovation policy formulation (Denmark, Netherlands)
- New applications of foresight (Norway)
- Greater regional emphasis (Norway)
- Internet-based management systems for support programmes (Czech Republic, Spain)
- Streamlining and improving the accessibility of innovation support delivery (Finland, Germany, Hungary, Ireland, Latvia, Spain)
- New arrangements for innovation performance monitoring and evaluation (Cyprus, Estonia, Hungary (pending), Iceland, Luxembourg, Romania, United States)
- Shift towards innovation oriented policy rather than R&D policy (Luxembourg)
- Introduction of ‘mini-mixes’ (Netherlands)
- Reduction of regulatory and administrative barriers (Malta)
- Changes to the immigration law (Austria)
- Broader regulatory policy initiatives (China)
5 Expenditure on innovation support

5.1 Key issues and concerns

The Commission Discussion note ‘Consultation on ‘More efficient support for innovation’ ‘ states that ‘more efficient innovation support mechanisms are urgently needed to better and faster transform research into new products and services' whilst, at the same time, acknowledging that ‘it is unclear how much money is publicly spent to foster innovation in Europe’. Further, it states one of its aims to be to move towards better defining the policy rationale for public innovation support mechanisms in Europe, ‘with the objective to increasing their impact and reducing their administrative burden’.

This raises two linked issues. The first concerns the costs of innovation support measures and poses the question ‘what is the level of return to the economy that results from the public sector’s expenditure on innovation-related activities?’ The second issue relates to the costs of delivering innovation support (i.e. it separates the administrative costs from the overall budget of the measure or service, which can include direct grant funding, loan or tax exemption).

For the first question, setting aside the European Innovation Scoreboard measure of ‘innovation efficiency’, which looks at the relationship between input and output, it is immediately clear that, in terms of innovation support mechanisms, the relationship between costs and efficiency is not easily defined. There are several reasons for this.

As noted in Section 2, innovation support measures span a range of modalities of operation and target a variety of actors. Thus, to define a ‘typical’ measure on which to base comparative analyses is far from straightforward, although the categorisation presented in that section might be useful in identifying types of measure for which budgetary data would be available. For example, simple industrial grant schemes and many industry-academia support measures often have clearly defined budgets over distinct timeframes. However, determining the outcome and impact of even these ‘simple’ support schemes requires, in the first instance, a robust evaluation. And, as many policy makers know, the efficacy of available evaluation practices, for reasons of attribution, additionality and timing, precludes a precise calculation of the financial outcomes of the supported activities. Thus, simple collation of the costs of the different innovation support measures in place across the EU and elsewhere would provide only the input side of the efficiency equation. Moreover, many innovation support schemes do not have clearly defined budget lines. For example, an information dissemination service for SMEs, may offer a variety of parallel services as part of a broader portfolio of activities. Allocating a definitive budget line to the service’s innovation-relevant activities only would be highly problematic. Similarly, web-based services and IP advisory systems would also fall into this category. A third difficulty is posed when considering the scope and scale of a measure; a measure may address a broad audience of SMEs with a series of small grants or loans, whilst another may support large-scale R&D projects in a handful of large companies, yet both may have the same scale of budget although their impacts would be hard to compare.

To illustrate the general problem of obtaining comparable data on innovation support, the following outlines the experience gained from the survey of Trend Chart National Correspondents. In this particular case, the question posed was:

‘Approximately, how much is spent on innovation support measures (as an absolute value and as a proportion of total GBAORD)? This includes indirect measures but does not include direct support for public R&D.’

The collected data exemplified two major problems of collecting information of this nature through a relatively simplistic questionnaire exercise. First is the issue of definition. Innovation support can be defined in a variety of ways and may often include public support
for R&D. Whilst this should not include expenditure in support of public R&D, measures designed to promote knowledge transfer between the public and private sector frequently include this form of support, and therefore it may be difficult to derive separate budget lines. (Several authors made a distinction between R&D- and non-R&D-related innovation support, although data on these categories was not always available). Secondly, even in cases where the responsibility for innovation support is vested in a single agency, data on expenditure on the full portfolio of innovation support measures, including indirect support and information and dissemination activities is often unavailable. In addition, the availability of data was subject to a range of temporal constraints, which further militated against comparability. For these reasons, only the following broad points can be derived.

There is a prevalent difficulty in obtaining consistent data on innovation expenditures, both in absolute terms and as a proportion of GBAORD. In some countries, recent shifts in the perception of innovation and the consequent changes in the way that innovation policy is expressed and supported have further compounded these difficulties. The fragmented nature of the innovation system (especially in strongly regionalised governance systems) was quoted as a further reason why such statistics are hard to define. Several countries reported that there is no specific budget category for innovation support within their national statistics.

The second point made above, relating to the (administrative) costs of delivering innovation support, raises the need to separate the value of the service being provided (to the recipient) from the administration costs (to both the sponsor agency and to the recipient). If the support mechanism consists of the relatively simple provision of financial resources then it is probably safe to assume that the internal (agency) and external (participant) administration costs should be kept to a minimum. However, low administration costs do not necessarily infer good value for money. For example, a highly bespoke support programme (which might offer a range of support activities), tailored to the particular demands of a limited number of clients, would entail high administration costs on the part of the delivery agency, and possibly also on the client's behalf. However, the potential returns (and hence the rate of return) on this administrative investment could far exceed a broad scale support measure with low administrative demands.

Thus, it was concluded that the information gained from this particular element of the survey was not usable other than in exemplifying the issues that arise in attempting to obtain such data.

The specifications for this mini-study also included a suggested analysis of the administrative costs of innovation support measures. The proposal was to benchmark the 'time from idea to contract in different systems across Europe, including time from policy idea to policy decision, time from policy decision to call publication, time from call publication to contract signature'. The intended outcome was to determine the cost, on average, to manage the technical and administrative procedures to set-up an innovation support measure, from policy idea to contract signature (in terms of allocated time of internal administrative staff, plus any external costs such as evaluators, reviewers, surveys, consultation, etc).

Again, this raises several issues. First, what is a 'typical' measure? How does one gauge when an idea is first formed and developed into a policy action? A comprehensive study would need to be conducted to gain a full picture of all the available types of measure and even then, in the absence of an 'optimal' benchmark, an average gestation time for policy measures would have limited policy utility. On the practical side, it is unlikely that any policy maker would be able to provide a meaningful generic answer without recourse to a detailed 'time and motion study'. Policy makers undertake a variety of tasks - to extract the time spent on the design and development of a specific measure would require them to be subject to strict regulations for keeping detailed timesheets. If the highly variable 'external' costs for evaluation, review, etc., were to be added, a wide spectrum of potential costs would be
generated. The above arguments also ignore the issue of quality, of administration and processes such as review, evaluation, etc.

In the above discussion, the issue of ‘external’ administrative costs, i.e. the costs of participation to the target or recipient, was raised. In theory, if these costs are viewed as a barrier to participation, then the opportunity for their reduction would form a potential area for policy action. In addition, if national or regional governments have already made efforts to reduce these costs, the dissemination of examples of existing good practice would offer an opportunity for the Commission.

Two of these issues, the internal administrative costs and external administrative costs will be examined in more detail below.

5.2 Internal administrative procedures and costs

As an empirical exercise to obtain data on the costs to administer innovation support measures, as experienced by government agencies, a limited set of questions was formulated with the intent to develop a survey of the Trend Chart Network of National Correspondents. As already discussed, such costs may be internal (i.e. incurred by the deliverer of the support service, usually government agencies, departments or ministries) or external (i.e. incurred by the applicant or target of the support service). The main concern of the Commission was on the internal costs and, initially, data was requested on the time taken from the inception of a new measure through to its delivery. This raised a number of definitional issues, but also had implications for large informational demands, which, even if available within innovation support agencies, would entail excessive resource costs to access. Thus, it was felt that the likelihood of a comprehensive set of answers to these questions would be limited.

However, in the discussion surrounding the development of the questionnaire, some insights to the situation pertaining in Estonia were provided. These are presented below.  

Alasdair Reid, personal communication, March 2008.
Box 1.

1. Typical time taken to develop policy measure:
   a. from policy idea to policy decision:
      Estonian innovation policy has developed in a series of steps since about 2000. Some of the
      ideas have been under consideration for around 5-6 years; others (e.g. Competence Centres
      or Innovation Awareness) have progressed from idea to implementation in maybe 18-36 months.
      Ideas such as grant support for hiring ‘knowledge or innovation specialists’ by enterprises, first
      suggested in 2002, is only now being developed into a programme following a feasibility study.
   b. from policy decision to call publication:
      This depends on what is meant by ‘policy decision’ - the act or ministerial decision setting the
      framework or just the decision of the officials in the ministry to pursue an idea into a more
      concrete form. If it is the former, then the time is rather short (about 6-12 months), if the latter,
      then see previous answer.
   c. from call publication to contract signature:
      This is very difficult to specify and depends on the programme. For example, the Competence
      Centres call led to initial feasibility funding and a second stage of full funding over 12-18
      months. A probable ‘guesstimate’ would be around 6 months on average but one would have to
      refer to Enterprise Estonia and it is uncertain whether their monitoring data would be able to
      give a precise answer.

2. Cost to manage the technical and administrative procedures to set up an innovation support
   measure (from policy idea to contract signature, in terms of allocated time of internal
   administrative staff, plus any external costs such as evaluators, reviewers, surveys, consultation,
   etc.).
   Most (recent) Estonian innovation policy measures have been based on an external feasibility study
   (sometimes including surveys, always including benchmarking and consultation with stakeholders).
   Budgets probably vary, but for a restricted sample the range is €40-60,000 for external consultants. To
   this could be added a person-year of the time of an official from the Ministry of Economic Affairs
   (guessed at €20,000-40,000?) plus time for the implementing agency (Enterprise Estonia), the Ministry
   of Finance (responsible for Structural Funds), etc. to further develop the programme.

3. Views on the appropriateness of the administrative procedures for managing a project.
   From the perspective of a “neutral” observer, it appears that the Estonian system adopts a reasonable
   approach: external consultants are generally contracted and significant staff time is dedicated within the
   Ministry (executive level) and at Enterprise Estonia (implementing level). However, the definition of an
   “appropriate administrative procedure” (or, for that matter, an “administrative procedure”) is an issue that
   invites broader discussion. Such a definition would need to consider the development of a full
   understanding of the implications of initiatives. Also, for example, does benchmarking information on
   other programmes (Estonians always request this, which could be considered good practice from that
   perspective) do more than provide some indications on the main principles, but hide the detailed issues
   which should be addressed when taking programmes from concept to implementation? Evidence
   indicates that feasibility studies may not fully prepare the legal and State Aid groundwork required for
   programme realisation.

Further information on the internal administrative costs of programme management is
available from a 2005 study into the efficiency of Member States’ implementation of the
Structural Funds26. The authors note the difficulties in assessing the costs of implementation
across such a diverse range of administrative, institutional, political, socio-economic and
Cultural contexts. They highlight two aspects of costs that deserve to be examined:

- The absolute costs of implementation expressed in amounts spent on technical
  assistance (TA), numbers of people employed and costs of human resources (HR)
  employed (a measure of economy and efficiency).

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26 A Study on the Efficiency of the Implementation Methods for Structural Funds Final Report, A report by ÖIR in
association with LRDIP and IDOM, Commissioned by: European Commission Directorate General Regional
Policy, Vienna, December 2003
• The cost-effectiveness expressed in terms of the programme’s absorption rate of funds and implementation progress (an important dimension of effectiveness).

As there is insufficient data of a uniform nature on cost effectiveness to enable a cross case study comparison, the report focuses exclusively on the question of absolute costs of implementation.

The study undertook a case study analysis of the costs involved in the implementation process, which involved measurement of the following indicators of cost:

• Absolute overall cost of the programme, including public (national, regional, local and EU Funding)
• Absolute level of Structural Funds costs for the programme
• Rate of contribution from Structural Funds to overall programme cost (including contributions from all funds involved in the programme covered by the case study)
• Absolute cost of technical assistance (TA1 and TA2) for the programme. The figures relate to allocated TA and not absorbed TA.
• Rate of TA involved
• Estimated or actual numbers of HR employed directly in programme implementation
• Estimated cost of HR in programme implementation based on a notional cost of Whole Time Equivalent (WTE) of €80,000, to include all costs of salary, social costs and accommodation.
• Costs of implementation, calculated as the sum of total TA costs and total HR costs, expressed as a percentage of total costs of programme
• Costs of implementation, calculated as the sum of total TA costs and total HR costs, expressed as a percentage of SF contribution to costs of programme.

Several difficulties were encountered with the data gathering:

• Problems in obtaining a clear uniform picture of the total number of people involved in programme implementation across all of the case studies. Frequent recourse to estimations was made.
• Problems with estimating the cost of one WTE across all of the different settings. A notional, uniform cost of one WTE had to be used.

The results of the case studies are presented in a series of tables in Annex V. The authors admit that the generality of the cost assumptions and the lack of a detailed analysis of context precludes a conclusive assessment of costs overall, although it presents interesting questions that would merit further study and consideration. Differences in the context between regions and Member States make it very difficult to attain comparable data as a basis for solid conclusions.

From the available information, the authors conclude that differences in costs are apparently not related to the type of administrative system (i.e. decentralised or centralised). In addition, the level of implementation costs did not seem to be related to programme type and programme size. An interesting point (which was postulated in Section 5.1 above) is that programmes with the lowest costs are not necessarily more efficient than those with the highest costs. Such an expectation makes assumptions about the appropriateness of staffing levels.

The report makes the following summary conclusions in relation to costs:

1. ‘There are significant differences in costs from one programme and from one region to another. The relative size of these costs do not seem to be necessarily related to the
type of administrative system, the type of programme or the relative size of the programmes. There would appear therefore to be other factors at work within the programmes that are causing this wide diversity. One possible explanation may be the differences in the way that salaries of public servants working full time on the implementation of the programmes are handled. It is clear however, that there are differences in the way in which TA is handled throughout the implementation system and there is a lack of information on the overall level of costs of implementation.

2. The costs of implementation of a programme need to be considered in greater detail during the planning and programming period. It would not be difficult to provide this kind of information in the Programme Documentation and it could serve as a useful point for analysis during the *ex ante* and mid-term evaluations.

3. There appears to be a compelling case for a more detailed and focussed study on this question across the whole of the Structural Funds implementation system.'

Finally, evidence on the variability of administrative costs within a single policy support measure is available in an interim evaluation of a UK scheme\(^{27}\). The Regional Innovation Fund (RIF) comprised support to the English Regional Development Agencies (RDAs) for the development of innovation related activities in their respective geographic regions. Funding commenced in 2001, although pre-existing measures were in place; these were subsumed into the RIF in 2001 and subsequently viewed as components of the scheme. In turn, the RIF itself was subsumed into the more flexible ‘Single Pot’ funding available to the RDAs.

The evaluation report provides information on the (available) equivalent administration costs for the RDAs (see below). It highlights three main issues:

- The administration of the RIF over the first three years incurred significant costs - £1.5 million over the first three years of its existence, equivalent to almost 2% of the total programme expenditure over this period;
- Significant increases took place in this administration expenditure for some RDAs over the three year period; and
- There was substantial variation in the total administration costs between RDAs – ranging from £28,000 to £388,000. With a single exception, (ONE, which had the highest number of projects (119) and total project spend (£12.4 million), there was no evidence of a correlation between RDA administration costs and the scale of RIF workload.

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\(^{27}\) Regional Innovation Fund: Interim Evaluation Main Report, DTZ Pieda Consulting, Department of Trade and Industry, Ref: 01/09808-2, January 2003
In the view of the report’s authors, these findings raised important questions relating to:

- The underlying causes for such large variations in administration costs between RDAs;
- The possible existence of a correlation between higher administration costs and management effectiveness, for example ease of access to monitoring information. The report noted that the authors were not convinced that such correlations exist due to the fact that some of the lowest cost RDAs were the most efficient in providing the necessary monitoring information to the study team.

In the opinion of the evaluators, the most likely explanation for the level of variation was that the RDA staff had interpreted ‘administration costs’ in different ways. Thus, rather than focusing on management and administration costs for the funding streams only, the high cost RDAs also included staff time devoted to the management of individual projects. The authors also note the difficulty in securing this information in the first place (three RDAs failed to provide any information at all), which meant that they were unable to confirm this hypothesis.

### 5.3 External administrative costs to participants

Another strand of this INNO Learning Platform study, Mini-Study 2, deals with the perceived barriers to innovation and touches upon the issue of access to innovation support schemes. It notes that large firms tend to use sources of innovation support more than small or medium companies do. Whether administrative costs form a greater barrier to participation by SMEs is not specified in the report, but could warrant further investigation. Some qualitative evidence to support this possibility has, however, been generated as detailed below.

As noted in the Methodology (Section 1), and in the preceding section, as an input to the INNO Learning Platform Mini-studies, the Commission requested the Network of National

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Correspondents of the European Trend Chart on Innovation to undertake a short survey on the administrative costs of innovation support. In the light of discussions on how to obtain such data, the decision was taken to focus on the perceived external costs to participation in innovation support schemes and on whether or not these were viewed as a barrier to participation by companies and other targets of innovation support measures.

The first question posed was:

'Is there any evidence in your country that companies perceive the administrative costs of accessing innovation support as a barrier to participation? Please give any examples and the specific perceived costs (for example, processing of applications takes too long, application procedure is too bureaucratic, chance of success is too uncertain given effort required, etc. - please give any other relevant examples)'.

The second question asked:

'In your country, have there been any examples of a movement towards increasing the efficiency of the delivery of support measures? This might include:

- simplifying the eligibility criteria;
- combining several similar measures into a broad package of support;
- reducing the admission barriers (i.e. introducing two phase programmes - pilot and full participation subject to performance);
- reducing the time from call publication to programme start (i.e. contract signature);
- conducting ex-ante impact assessment (including surveys, consultation, etc.);
- other strategies (please give examples)'

5.3.1 Perceptions of administration costs as a barrier to participation

The perception that administrative costs presented a barrier to participation in innovation support measures was supported by a substantial amount of both hard evidence (i.e. from reviews, surveys and evaluations) and anecdotal evidence from several countries. Some of the more specific issues reported concerned:

- The existence of policy mixes comprising large numbers of measures, sometimes with overlapping goals, which promoted confusion and a loss of clarity amongst the potential targets and applicants. (For example, in Austria, Denmark, France, Hungary and Iceland).
- Poor general awareness of the opportunities for innovation support and the types of support available (Sweden, Brazil, China).
- The absence of a long-term government strategy and commitment to innovation support thereby creating uncertainty amongst potential applicants (Hungary, Italy).
- Unpredictability of funding of specific measures and use of 'one-off' measures (Hungary, Italy)
- Frequent changes to administrative personnel in government support services and other losses of continuity (e.g. political change) (Greece)

Of more specific relevance to this Mini-study, some examples of specific operational characteristics were also reported. These included:
• The absence of, or poor information, on a specific programme (reported in Latvia, Switzerland and Brazil)
• A lack of proactive support for companies: i.e. measures and support services tended to be generic and not tailored to the demands of specific sectors or types of companies (Austria, Malta).
• A lack of expertise on the part of the applicant for undertaking the application process (especially prevalent amongst SMEs). In some countries, this was found to promote the need for the use of (often expensive) external consultants to assist in the application process (Ireland, Latvia, Malta, Croatia, Norway, Israel).
• The existence of multiple funding agencies and fragmented service delivery, which introduced excessive complexity into the process of seeking and applying for funds (Finland, Norway).
• Complicated and/or lengthy application procedures (with many countries noting the EU funds, such as Structural Funds and the Framework Programme as particular culprits) (Czech Republic, Estonia, Finland, Hungary, Ireland, Luxembourg, Slovakia, Slovenia, Sweden, UK, Bulgaria, Norway, Brazil, China, USA). Some more specific issues concerned:
  o High entry costs (although this could be offset by subsequent process being relatively easy, as in the French tax credits for R&D measure)
  o Assessment processing of applications took too long (Greece, Portugal)
  o Inappropriate information demands made on applicants (Norway)
  o Financial disclosure requirements were felt to be a risk to company business planning (Slovenia)
  o Delays in the publication of calls (Italy)
  o Time delays in the financial payments to successful participants (Czech Republic, France, Hungary, Portugal, Slovakia, Bulgaria)
  o High compliance costs for SMEs or start-ups (Germany, Italy, Malta)
  o Burdensome reporting requirements (Hungary, Ireland, Brazil)
  o Uncertainty of eventual success discouraged applicants (Croatia)
  o Low programme success rates (Canada, China)
  o Eventual rewards (which are assumed to be the financial rewards rather than the overall programme benefits) do not justify the input; low benefit to cost ratio (especially for small programmes) (Ireland, Portugal)

5.3.2 Policy responses to reduce administrative costs
In response to these varied problems and issues, a number of governments and agencies had put in place a range of remedial or mitigating actions. These included:

• Attempts to identify potential problems in advance, such as:
  o Reviews of ways to improve the business environment for potential applicants. This could include the use of customer surveys and on-going or ex post assessments of specific programmes. (France, Malta, Japan, Netherlands, Norway, UK, Sweden, Romania, USA)
  o Undertaking feasibility studies or ex ante assessments of new programmes (with recommendations for administrative improvements) (Estonia, Portugal, Sweden)
  o The use of pilot phases prior to the launch of the main programme (Portugal)
• Initiatives to promote the awareness of innovation support opportunities:

29 Somewhat ironic, given that the rationale of public support is to reduce firms’ uncertainties in undertaking innovation.
- On-line information dissemination services (Spain, Germany, Luxembourg, Norway)
- Better awareness promotion and targeted marketing of support to potential high value beneficiaries (Finland)
- One stop shops (for SMEs) at regional or other levels (Spain, France, Hungary, Romania)
- General openness and transparency of government policy (Sweden)

- The re-design, or changes in the presentation, of innovation support services and measures:
  - Attempts to deliver a less complicated approach while maintaining flexibility, including the gathering of programmes into larger bundles (with broadly similar objectives), and the streamlining of measures (Spain, Hungary, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, UK)
  - Better coordination of delivery services (Finland, Netherlands, Slovenia)
  - Replacement of reimbursable loans by grants (France)

- Provision of (more general) business assistance to companies:
  - Improvement of consultation services for applicants or provision of access to such services (Latvia, Romania)
  - One-stop shops for business establishment ³⁰ (Cyprus)
  - Broader reduction of red tape (rules and regulations) for companies (Malta, Netherlands, Sweden, UK)
  - Reduction of company start-up time (Iceland, Romania)
  - Simplification of procurement and tendering process for SMEs (Ireland, Netherlands)

- Programme-specific changes:
  - The use of integrated project management systems for new programmes (Spain, Italy)
  - Some countries favour periodic open calls for tender (Portugal), although others use continuous application approaches (Luxembourg)
  - Use of simplified or broader eligibility criteria (Brazil, Hungary, Norway)
  - Reduction of the time between application and notification (Brazil, Sweden, Slovakia, Japan)
  - Improvement of the transparency of proposal assessment procedures (Brazil)
  - General simplifications to the administrative process (reduction of delays, etc.) (France, Latvia, Netherlands, Norway, Sweden, Turkey)
  - Facilitated (i.e. customised) application processes for SMEs (Ireland)
  - Dedicated assistance from funding agency to applicants (Canada, Israel)
  - The use of multi-phase assessment processes (to decrease the costs incurred in proposal preparation) (Canada, Switzerland, Czech Republic, Denmark, Malta). However, this approach was tried and dropped in Greece.
  - The use of on-line application processes (Czech Republic, Switzerland).

³⁰ The use of the ‘one-stop-shop’ concept as a means of contributing to greater awareness and reducing the administrative costs of participation, especially to SMEs, forms part of the rationale for the creation of the Enterprise Europe Network. The issue is dealt with in the corresponding Mini-study (specifically Section 3): Gailly, B., New perspective for the Enterprise Europe Network, INNO Learning Platform Mini-study Report 7, 2008.
6 Conclusions

6.1 Towards a definition of innovation support measures

There has been a trend to extend the boundaries of innovation policy, from science and technology policies towards definitions encompassing the range of actors and activities comprising the national (or regional) innovation system. Accordingly, definitions of innovation policy support measures must take account of the scope of the prevailing view of innovation policy applied within the national or regional context. Although it has been suggested that enterprises should form the primary beneficiaries for innovation policies, this seems too restrictive, given the pervasive and networked nature of innovation processes, which now include notions of creativity and design, user-driven and society-driven innovation.

It is suggested that the definition proposed by Reid and Peter (2008) is an appropriate one, thus: ‘an innovation policy measure can be defined as any action taken or (co-) financed by the public sector with the aim of influencing innovation processes and capacities in enterprises’. Clearly, within an innovations systems framework, this offers a broadly inclusive definition.

The approaches adopted within Trend Chart seem to provide some useful systems for the categorisation of measures. The first categorisation of measures developed under Trend Chart provided a relatively comprehensive framework, albeit with the possibility that individual measures could be allocated to more than a single category, whilst later typologies tended to utilise a mixture of targets, policy objectives and modalities by which to categorise measures. This latter approach seemed to offer further scope for the multiple categorisation of measures, particular in the light of an observed tendency towards the use of so-called mini-mixes or ‘packages’ (see below). Clearly, it is desirable that effective categorisation systems should minimise such duplications, although in the case of mini-mixes, this is difficult.

An alternative, investigated in the early stages of Trend Chart, is to employ a matrix approach defined by modalities of action along one axis and targets along the other axis. As this did not conform to the need to reflect broader policy goals at various stages of the Trend Chart initiative, this methodology was never fully investigated, but might be worthy of further investigation.

6.2 Major features of innovation support

In the absence of a consistent and agreed framework for the categorisation of measures, it has been difficult to identify anything other than broad trends in the areas addressed by innovation support employed over recent years. Nevertheless, some broad tendencies do seem to appear. One of these, which formed the focus for more specific consideration concerns an increase in policy interest in the services sector and for the support of non-technological innovation. However, from the available information, it seems that technological considerations still play a strong role in innovation policy support although support for areas such as organisational innovation are being developed.

It is clear that the broad categories used in the early days of Trend Chart mask a large amount of important variability in the specific nature, size, mode of operation and other key determinants of innovation support measures. For example, the category 'Intensified co-operation between research, universities & companies' consists of a range of diverse measures such as R&D cooperation grants, mobility schemes, vouchers, etc. Perhaps one important lesson for policy learning, then, is to examine the ways in which countries have sought to address specific policy challenges within a contextual framework derived from the interaction of modalities and actors described in the previous section.
However, some degree of caution should be exercised when observing such trends and in drawing conclusions from them. As has been argued elsewhere, the development of a policy mix is an evolutionary process, which is influenced by the national and regional context, the maturity of the innovation system, lessons derived from other countries, regions or policy contexts, etc. Thus, any observable trends should represent the outcome of this process, which must be fed by a strong, coordinated governance system incorporating rigorous procedures for review, monitoring and evaluation. The potential for policy learning from a study of broad trends is minimal. However, valuable lessons may be learned from the experience of other, individual countries in addressing innovation challenges where contextual variability can be controlled or allowed for. The significance of policy learning is clearly highlighted in the following section.

6.3 Emerging trends in support of innovation

Several new and novel forms of innovation support were offered as examples, addressing *inter alia* issues such as sustainability, high-risk innovative projects, procurement, public-private ventures, streamlining and mini-mixes, and targeted support. One strong emergent tendency seems to be towards greater simplification of the nature and range (but not the scope) of innovation support mechanisms. Thus, we can observe re-organisations and streamlining of the innovation policy mix (such as the UK's Simplification of Business Support Schemes), or the introduction of packages (as exemplified by the Dutch case) or the widespread uptake of flexible measures such as innovation vouchers. As noted above, support for non-technological innovation is developing, but as a minor trend only.

The extent to which countries are now employing measures that are explicitly or implicitly based on or derived from versions successfully employed in other countries tends to suggest that significant policy learning is taking place. A potential area of action for the European Commission would be to assist further in the identification and dissemination of policy 'success stories'. However, an accompanying caveat to the transfer of policy measures is that extensive investigation into the context of both the ‘donor’ and ‘recipient’ countries remains a priority in order to ensure that, firstly, the potential benefits of the transplanted measure will still be obtained, and secondly, that measures are not copied indiscriminately thus resulting in the growth and potential confusion of the policy mix.

Despite some apparent shifts away from a bias towards technological innovation support, there remains a strong focus on services sectors which have a high technology component (such as Knowledge Intensive Business Services or KIBS) or which extensively use (or could benefit from greater use of) ICT. Moreover, the efforts made by several countries in developing a greater understanding of the role of R&D in the services sectors also tend to support the idea that innovation support is still often considered to have a strong technological component.

Nevertheless, there does seem to be an observed (although quantitatively unsubstantiated) trend towards greater support for non-technological innovation (such as the dissemination of best practice in organisational innovation, for example), particularly targeted at SMEs. Further analysis of this is recommended.

6.4 Expenditure on innovation support

Firstly, it is evident that there are major problems in both obtaining accurate financial data on the costs of innovation support and, more importantly, on comparing such costs across a diverse range of innovation support schemes. Second, the idea of an ‘innovation efficiency’

31 Cunningham, P.N., Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: The “POLICY MIX” Project: Thematic Report: Governance, European Commission, January 2008.
based on a comparison of input/output statistics is problematic in that the metrics for input are not comparable to those of the outputs. Moreover, the strategic importance of the innovation challenge may require large inputs in the expectation of minor immediate paybacks but significant long-term gains. Indeed, the systemic nature of innovation seems to militate against the utility of such linear calculations.

In terms of the internal administrative costs of implementing innovation support measures (i.e. the costs to the implementing agency itself), the available evidence suggest that there are significant difficulties in obtaining such information on a systematic and comparable basis. Attempts to obtain such information point to significant variability in data, which may be compounded by definitional problems. In addition, low internal administration costs cannot be automatically equated with the notion of effectiveness; a highly targeted, time-intensive and tailored package of support may result in better innovation ‘outcomes’ than a low-cost, broad-brush form of support which results in minor outcomes. The authors would strongly caution against any attempt to benchmark such administrative costs across the EU administrations, given the inter- and intra-country heterogeneity of these systems.

The area with the greatest potential for increasing innovation policy impact seems to be in the reduction of external administration costs, i.e. those incurred by the participants to the support measure, which may act as a barrier to entry. Substantial evidence was found which indicated that issues such as poor awareness, confusion amongst support schemes and inconsistency of support were all factors perceived as potential barriers to accessing innovation support.

At the programme level, several administrative factors were found to act as potential barriers to participation, such as poor information, absence of proactive support, lack of expertise on the part of the applicant, fragmented service delivery and complex or lengthy application procedures. These factors have been recognised by a number of innovation agencies and government countries which have sought to rectify or reduce them through a number of approaches including attempting to identify potential problems in advance, awareness promotion, re-design of innovation support services and measures, the provision of (more general) business assistance to companies, or through programme-specific changes.

Once again, we would caution against any attempt to undertake an EU-wide benchmarking of such costs, due to the contextual conditions within which measures operate. This variability would certainly exist between countries, even in the case of similar types of measures addressing similar groups of actors. Instead, we would advocate that the Commission should highlight the need for Member States to determine the extent to which administrative costs act as a barrier to participation (particularly in the case of SMEs), to obtain data on the specific costs entailed and to take action to mitigate these effects, perhaps through policy learning from other countries.
References


Cunningham, P.N., Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments: The “POLICY MIX” Project: Thematic Report: Governance, European Commission, January 2008.


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<table>
<thead>
<tr>
<th>I. Fostering an Innovation Culture: Promotion of the benefits of innovation. Includes measures stimulating creativity, initiative and enterprise, calculated risk-taking, acceptance of social, geographical and professional mobility; Development of skills, including those dealing with information collection and processing and personal and social communication skills; Developing the ability to anticipate needs and improve organisational capabilities; Improving awareness dissemination and strengthening co-operation to transfer skills and experiences.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I.1 Education and initial and further training</td>
<td>Specifically this deals with education and initial and further training in the context of skills acquisition which may be relevant to enhancing the innovative capability of individuals, including technical training, vocational studies, etc. Broadly, it includes actions which 'concentrate on imparting the skills that are needed to produce and implement innovation'. Lifelong learning should be included, as should the acquisition of 'a basic educational grounding which is essential to facilitate ongoing adaptation to the new skills that innovation requires'. Distance learning and multimedia should not be neglected. However, all activities in this category are external to the firm environment. Measures affecting the innovative capacity of firms are dealt with under I.4.</td>
</tr>
<tr>
<td>I.2. Mobility of students, research workers and teachers</td>
<td>This covers the mobility of students, research workers, engineers or scientists from one country or industrial sector to another, and from education or research to industry, which has the effect of encouraging the transfer of technology and the dissemination of know-how.</td>
</tr>
<tr>
<td>I.3. Raising the awareness of the larger public and involving those concerned</td>
<td>Innovation can develop and spread only if it is accepted by society. Actions here reflect the stimulation of public awareness and acceptance of science and technology, the stimulation of consumer demand for technological novelty, innovation in forms of social organisation and communication, and measures which affect the attitudes, values and positions of the social groups involved towards aspects of innovation.</td>
</tr>
<tr>
<td>I.4. Fostering innovative organisational and management practices in enterprises</td>
<td>This is, of necessity, a broad category. Innovation is primarily the responsibility of enterprises, and managing change is one of the main challenges with which they have to cope. Actions under this category range from promoting the ability of enterprises to: keep abreast of changes in markets and techniques and the related methods of design, production and organisation; stimulate the absorption of new techniques and know-how; modernise their structure and organisation, and reshape methods, roles and responsibilities; develop technological, economic and business ‘watch’ capabilities; develop their human capital (training within the firm); and adopt benchmarking and the spread of ‘best practice’ (both technical and managerial). It also includes the provision of technical, commercial and managerial advisory services.</td>
</tr>
<tr>
<td>I.5. Public authorities and support to innovation policy-makers</td>
<td>Includes measures aimed at informing and raising the awareness of the importance of innovation and technology to politicians, senior officials, regional authorities, project and fund managers; improving performance and spreading innovation in the public sector and in government; promoting more active competition in the case of public invitations to tender; monitoring and analysis of innovation processes, results and impacts at the socio-economic level; comparative studies of innovation systems, policies and infrastructure. Actions encouraging the exchange of information and experience among the Member States and those stimulating the development of harmonised statistical information systems, including regular surveys on innovation in industry, services and SMEs, are also covered.</td>
</tr>
<tr>
<td>I.6. Promotion of clustering and co-operation for innovation</td>
<td>Actions dealing with intra-sectoral co-operation and collaboration. Includes aspects of promoting the dissemination of best practice, ‘cluster’ and network development, measures facilitating the activities of trade organisations, development of sectoral information databases, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Establishing a Framework conducive to Innovation: Permitting innovation to flourish and grow. Allowing co-operation to operate correctly; the effective and economical protection of intellectual property; reducing the burdens to enterprises whilst maintaining consumer safeguards; allowing access to funding and easing financial constraints to innovation.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>II.1. Competition</td>
<td>Involves measures designed to stimulate competition - one of the driving forces behind innovation. Measures covered include those designed to combat monopolies and to open and liberalise markets and those aimed at the deregulation of protected or compartmentalised sectors. Also covers measures which ensure transfer of technology and the exploitation of patents without undue distortion of competition; and harmonisation of the treatment of joint enterprises.</td>
</tr>
<tr>
<td>II.2.* Protection of intellectual and industrial property</td>
<td>Covers harmonisation of intellectual property protection systems; reducing complexity and costs associated with patenting and the maintenance of patents; hastening the formulation and adoption of standardised patent criteria and rules of legal protection; exchange of IP best practice; dissemination of awareness and information on IP protection and patents; support for legal costs of cases of patent infringement.</td>
</tr>
<tr>
<td>II.3 Administrative simplification</td>
<td>Excessive bureaucratisation and administrative overheads are recognised as potential barriers to innovation. This category covers measures designed to streamline administrative practices and may include the provision of on-line application processes, specialised help-line or advisory services, ‘one-stop shops’, simplification or transparency of eligibility conditions, simplified payment procedures, streamlined tendering procedures, etc.</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
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</tr>
<tr>
<td>II.4. Amelioration of legal and regulatory environments</td>
<td>This includes a broad range of measures including: modifications to Company Law; adoption and amendment of regulations and standards; promotion of performance standards and voluntary agreements; promotion of standards awareness and dissemination of information; harmonisation and streamlining of the legal environment; lifting of restrictions on the creation of new types of businesses and enterprises. Could also cover measures on the impact of legal and regulatory frameworks on innovation performance.</td>
</tr>
<tr>
<td>II.5. Innovation financing</td>
<td>Provision of finance for innovation activities. Includes measures designed to deliver, or stimulate the delivery, of financial support for innovation, including: mobilisation of private capital, equity finance, venture and risk capital; promotion of investment into RTD; creation of guarantee mechanisms; operation of stock markets, especially for growth enterprises; dissemination of information; development of specialist training; provision of advice; schemes to disseminate best practice and experience.</td>
</tr>
<tr>
<td>II.6. Taxation</td>
<td>Covers all aspects of the fiscal treatment of innovation, not only direct measures such as R&amp;D tax credits but also indirect taxes, social security measures, etc.</td>
</tr>
<tr>
<td>III. Gearing Research to Innovation: Improving the way in which the fruits of research are transformed into products, processes, services and, hence, contribute to competitive advantage and societal good. Includes strategic planning of innovation policies, support for the RTD process, identification of spin-offs and creation of new innovating firms, and stimulation of co-operation between the public, private and education sectors</td>
<td></td>
</tr>
<tr>
<td>III.1. Strategic vision of research and development</td>
<td>Covers initiatives aimed at developing long-term strategic approaches to research and its applications, particularly those targeted more closely at growth sectors of the market (including services) and at relevant gaps in national markets. Examples include initiatives such as 'Foresight', 'Key Technologies' and 'Delphi'. Similar measures which foster broad-based discussion of potential technology options, generate industry/research/public-sector/training/financing and other networks that initiate interdisciplinary and inter-sectoral thinking are also covered.</td>
</tr>
<tr>
<td>III.2. Strengthening research carried out by companies</td>
<td>Broadly involves measures designed to encourage and strengthen the performance of research within industry. This might involve schemes which involve: the participation of industry in the definition of national research projects; increasing the contract activities of universities and research institutes for industry customers; promoting industry participation in collaborative schemes such as EUREKA; direct and indirect institutional mechanisms.</td>
</tr>
<tr>
<td>III.3. Start-up of technology-based companies</td>
<td>Actions for encouraging researchers and engineers to start up technology-based companies, within universities ('incubators' and 'campus companies'), science parks or as spin-offs from larger firms. This will also embody aspects of measures for facilitating the spread of such practice (covering IPR, social rights, financial arrangements, administrative and legal simplification, etc.) and promotion schemes. Actions could also deal with the dissemination of best practice through pilot projects involving, for example, university technology-transfer departments and, the regional institutions concerned (e.g. local authorities, chambers of commerce), risk capital companies and technology brokers.</td>
</tr>
<tr>
<td>III.4. Intensified co-operation between research, universities and companies</td>
<td>Includes actions which aim to promote the dissemination of knowledge between research institutions, universities and companies. This may cover the development of closer links between research and training (anticipating the needs of the productive sector); facilitating university company start-ups, legal and contractual arrangements between universities and public research organisations for the exploitation of results with industry; demonstrator projects; co-financing schemes and awards for academic/industrial research co-operation; stimulation of dialogue between the producers and users of technology (such as sectoral and inter-sectoral forums, technology clubs, etc.); creation and growth of science and technology parks, etc.</td>
</tr>
<tr>
<td>III.5. Strengthening the ability of companies, particularly SMEs, to absorb technologies and know-how</td>
<td>This category may be distinguished from I.4 above in that it deals specifically with those measures which aim to improve the ability of SMEs to undertake innovation activities, particularly those at the research end of the innovation continuum. Such measures would include those designed to improve firms' access to new technologies, new techniques, etc. Examples could include direct R&amp;D grants, collaborative schemes and training in research.</td>
</tr>
</tbody>
</table>

### 1. Improve innovation governance and strategic intelligence for policy-making

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic vision</td>
<td>Development of strategic medium-to-long term vision of innovation challenges and innovation potential (at sectoral, regional, inter-regional, national and supra-national levels)</td>
</tr>
<tr>
<td>Innovation studies</td>
<td>Increase understanding of the nature of drivers and barriers of innovation activity in enterprises with a view to informing the policy-making process</td>
</tr>
<tr>
<td>Innovation strategies</td>
<td>Improve the effectiveness of the policy-cycle in order to increase the impact of public intervention on innovation activity and outputs in enterprises</td>
</tr>
<tr>
<td>Transnational co-operation</td>
<td>Encourage mutual policy learning and networking between policy-making at regional, national and EU levels.</td>
</tr>
</tbody>
</table>

Funding to public/private partnerships/organisations for the implementation of strategic intelligence exercises including technology foresight, sectoral road-maps, studies for knowledge-based foreign investment, etc. Carrying out or funding by public authorities of studies, development of statistics, surveys, etc. on regional, sectoral or national innovation system and in particular the role of enterprises. Could include 'scoreboard' type activities and benchmarking of performance at inter-regional or supra-national levels. Carrying out or funding by public authorities of strategic policy design initiatives and specifically dialogue/consultative exercises in partnership with the private sector and other stakeholders. Funding for all forms of inter-regional, cross-border, transnational actions aimed at facilitating an exchange of knowledge, know-how or tools and methods between policy-makers and/or managers of measures or organisations. This could include study trips, workshops, etc. (Exclusive of programmes funded by the Commission)

### 2. Foster an innovation friendly environment

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public procurement</td>
<td>Enhancing the role of public procurement and standardisation as drivers of new innovative products and services by enterprises</td>
</tr>
<tr>
<td>Administrative simplification</td>
<td>Reducing the administrative and transaction costs for enterprises in fulfilling their legal, administrative, fiscal, etc. obligations</td>
</tr>
<tr>
<td>Regulatory environment</td>
<td>Maximising the positive influence of new legislation or regulations on innovation activity in enterprises</td>
</tr>
<tr>
<td>State aid for innovative firms</td>
<td>Increase rates of expenditure on research and technological innovation in enterprises</td>
</tr>
<tr>
<td>Boosting technology adoption</td>
<td>Encourage the uptake of strategic technologies, notably ICT</td>
</tr>
</tbody>
</table>

All initiatives taken to ensure that public procurement and standardisation rules or procedures encourage innovative solutions from enterprises. All initiatives taken to reduce red-tape and ensure administrative simplification (including e-governance). All initiatives taken to appraise and minimise the negative impact of new legislative or regulatory proposals in any vertical policy field (e.g. environment, consumer, health & safety at work, ethical rules, employment law, etc.) on innovation activity. All forms of direct funding (grants, loans, equity, guarantee, tax subsidies, etc.) to enterprises engaged in pre-competitive, industrial (applied) research, development/prototyping, etc. All initiatives taken or funding provided to encourage enterprises to adopt, integrate and exploit the potential of new cross-cutting technologies in their production process, products or service delivery.

### 3. Encourage technology & knowledge transfer to enterprises and development of innovation poles and clusters

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruiting innovators</td>
<td>Facilitate access of enterprises to skilled personnel</td>
</tr>
<tr>
<td>Technology transfer</td>
<td>Facilitate the acquisition and transfer of knowledge and technologies to enterprises, encouraging in particular cross-border initiatives</td>
</tr>
<tr>
<td>Innovation intermediaries</td>
<td>Increase the availability, range and quality of specialised services to enterprises in order to increase the effectiveness of in-house innovation activities</td>
</tr>
</tbody>
</table>

Funding for the mobility / recruitment of staff by enterprises including non-nationals or to encourage experts to return from abroad. All forms of direct funding to enterprises for the purchase of services from knowledge institutions or technology transfer organisations, etc. Funding provided to public/private organisations in order to provide or coordinate the provision of specific innovation related services to enterprises (including technology transfer/brokerage, strategic and economic intelligence, manufacturing technology, quality and design advice, etc.)
### 4. Promote and sustain the creation and growth of innovative enterprises

| 4.1 | Funding innovative start-ups | Increase the number of new innovation intensive enterprises created and their survival | All forms of direct funding for the creation and early development phase of new technology based enterprises (including spin-offs from research organisations or large firms and venture cup type competitions) |
| 4.2 | Infrastructure for start-ups | Provide adequate infrastructure to new technology based firms (including start-ups and spin-offs) to facilitate their survival and growth | Funding for the construction and equipment of structures (incubators, science & technology parks, industrial research or training centres, etc.) with the mission to host and provide services to NTBFs (including spin-offs and foreign direct investment companies) |
| 4.3 | Ensuring competitive markets | Favouring the entry of innovative enterprises and business models to sectoral, regional or national markets | Legislative and regulatory measures taken to ensure that there are no barriers to entry or anti-competitive practices, including reforms to competition, state aid and company law (banking, accountancy, etc.) frameworks. |
| 4.4 | Leveraging private innovation finance | Increase the availability of private sector innovation financing to enterprises | Public funding provided to private (or public-private) financial service providers (including guarantee mechanisms) with a view to leveraging an increased private investment into innovation activities of enterprises |
| 4.5 | Optimising financial regulations | Optimising the legal/regulatory framework for the development of private innovation financing | All legal and regulatory measures taken to encourage the development of the venture capital market and the provision of innovation finance (including guarantee schemes for financial providers) |
| 4.6 | Exploiting new market opportunities | Promote adequate support to enterprises aimed at new and developing markets | All forms of direct funding or indirect support aimed at assisting enterprises to anticipate new market opportunities and to exploit them (e.g. pilot actions following up foresight exercises, economic intelligence actions for specific technologies or subsectors, etc.). |

### 5. Strengthen entrepreneurial innovation including the protection and commercialisation of intellectual property

| 5.1 | Innovation skills | Upgrading innovation related skills and diffusing new technologies in enterprises | Funding of training of employees and management including training on innovation management, new technologies, design, etc. (including access to e-learning) |
| 5.2 | Non-technological innovation | Increase rates of non-technological innovation in enterprises | All forms of direct funding to enterprises engaged in non-technological innovation activities including design, marketing, organisational innovation, etc. |
| 5.3 | Intellectual property protection | Favouring the protection and optimising the exploitation of intellectual property as a driver for innovation | All legal and regulatory action taken to improve the incentive to protect and commercialise intellectual and industrial (including trademarks, designs, etc.) property with a view to ensuring the diffusion of results from public research and incentives for private enterprises to invest in innovation. |
| Research Commercialisation | Increase the rate of commercialisation / marketing of the results of R&D activities by research and higher education organisations | Funding to ensure the commercialisation of the results of R&D activities from research organisations and higher education institutes (including university research commercialisation structures, proof of concept projects, financial support for patenting, etc.) |

<table>
<thead>
<tr>
<th>Monitored by</th>
<th>N° &amp; Short title</th>
<th>Specific objective of the measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Governance &amp; horizontal research and innovation policies</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| ERAWATCH/TC  | 1.1 Support to policy making (policy intelligence) | **1.1.1.** Strategy policy documents (official documents, policy consultation papers, green or white papers, Operational Programmes of Structural Funds),
**1.1.2.** Activities of official advisory and consultative fora
1.1.3 Policy Advisory services (technology foresight, scoreboard type activities, cluster mapping, sectoral studies of innovation) |
| ERAWATCH/TC  | 1.2. Research and Innovation strategies | **1.2.1 Strategic technology policies**
**1.2.2.** Innovation strategies |
| ERAWATCH/TC  | 1.3. Horizontal programmes / measures | **1.3.1 Cluster framework policies**
**1.3.2** Horizontal measures in support of financing
**1.3.3** Other horizontal policies (ex. society-driven innovation) |
| **2. Research and Technologies** |
| ERAWATCH     | 2.1 Research organisations | Policy measures concerning excellence, relevance and management of research in:
**2.1.1 Universities**
**2.1.2 Public Research Organisations**
**2.1.3 Research and Technology Organisation (private non-profit)**
**2.1.4 Research Infrastructures** |
| ERAWATCH     | 2.2 Science-Industry linkages | **2.2.1** Support infrastructure (transfer offices, training of support staff)
**2.2.2 Knowledge Transfer (contract research, licences, research and IPR issues in public/academic/non-profit institutes)**
**2.2.3 R&D cooperation (joint projects, PPP with research institutes)** |
| ERAWATCH     | 2.3 State aid measures in support of business R&D | **2.3.1** Direct support of business R&D (grants and loans)
**2.3.2.** Indirect support to business R&D (tax incentives and guarantees) |
| **3. Human Resources (education and skills)** |
| ERAWATCH     | 3.1 S&T education | **3.1.1.** Awareness creation and science education
**3.1.2.** Relation between teaching and research
**3.1.3.** Stimulation of PhDs |
| ERAWATCH     | 3.2 Research personnel | **3.2.1.** Recruitment of researchers (e.g. fiscal incentives)
**3.2.2.** Career development (e.g. long-term contracts for university researchers)
**3.2.3.** Mobility of researchers (e.g. brain-gain, transferability of rights ) |
| ERAWATCH     | 3.3 Skills development and recruitment | **3.3.1** Job training (LLL) of researchers and other personnel involved in innovation
**3.3.2** Recruitment of skilled personnel in enterprises |
<table>
<thead>
<tr>
<th>4. Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend Chart 4.1 Support to sectoral innovation</td>
</tr>
<tr>
<td>programmes</td>
</tr>
<tr>
<td>4.1.1 Support to sectoral innovation in manufacturing</td>
</tr>
<tr>
<td>4.1.2 Support to innovation in services</td>
</tr>
<tr>
<td>Trend Chart 4.2 Support to entrepreneurial innovation</td>
</tr>
<tr>
<td>4.2.1 Support to innovation management and advisory services</td>
</tr>
<tr>
<td>4.2.2 Support to organisational innovation incl. e-business, new forms of work organisations etc.</td>
</tr>
<tr>
<td>4.2.3 Support to technology transfer between firms</td>
</tr>
<tr>
<td>Trend Chart 4.3 Support to start-ups and access to finance</td>
</tr>
<tr>
<td>4.3.1 Support to innovative start-ups incl. gazelles</td>
</tr>
<tr>
<td>4.3.2 Support to risk capital</td>
</tr>
<tr>
<td>5. Markets and innovation culture</td>
</tr>
<tr>
<td>Trend Chart 5.1 Measures in support of innovation culture</td>
</tr>
<tr>
<td>5.1.1 Support to the creation of favourable innovation climate (ex. road shows, awareness campaigns)</td>
</tr>
<tr>
<td>5.1.2 Innovation prizes incl. design prizes</td>
</tr>
<tr>
<td>Trend Chart 5.2 Support to the creation of new markets</td>
</tr>
<tr>
<td>5.2.1 Fiscal incentives in support of the diffusion of innovative technologies, products and services</td>
</tr>
<tr>
<td>5.2.2 Support and guidelines on innovative Green Public Procurement (GPP)</td>
</tr>
<tr>
<td>5.2.3 Impact assessments (on research and innovation issues)</td>
</tr>
<tr>
<td>Trend Chart 5.3 Intellectual property protection and standards</td>
</tr>
<tr>
<td>5.3.1 Measures to raise awareness and provide general information on IPR</td>
</tr>
<tr>
<td>5.3.2 Consultancy and financial incentives to the use of IPR</td>
</tr>
<tr>
<td>5.3.3 Support to the innovative use of standards</td>
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</tbody>
</table>
Annex IV: Trend Chart ‘Policy priorities’ table

<table>
<thead>
<tr>
<th>Policy Priority Rankings September 2003</th>
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<tr>
<td></td>
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<tr>
<td>I.</td>
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<td>I.1.</td>
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<td>I.2.</td>
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<tr>
<td>I.3.</td>
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<td>I.4.</td>
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<td>I.5.</td>
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<tr>
<td>I.6.</td>
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<tr>
<td>II.</td>
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<tr>
<td>II.1.</td>
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<tr>
<td>II.2.</td>
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<tr>
<td>II.3.</td>
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<tr>
<td>II.4.</td>
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<tr>
<td>II.5.</td>
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<tr>
<td>II.6.</td>
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<tr>
<td>III.</td>
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<tr>
<td>III.1.</td>
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<tr>
<td>III.2.</td>
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<tr>
<td>III.3.</td>
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<tr>
<td>III.4.</td>
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<tr>
<td>III.5.</td>
</tr>
</tbody>
</table>

| Colour key |
| Relative Priority = | 0 | 1 | 2 | 3 | 4 | 5 | 6+ |

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Annex V: Cost effectiveness of SF implementation

### Cross Case Study Analysis of Costs

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Goal</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>3</td>
<td>Sachsen</td>
<td>6000</td>
<td>5760</td>
<td>75%</td>
<td>112</td>
<td>1.64%</td>
<td>270</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Niedersachsen</td>
<td>5200</td>
<td>3585</td>
<td>55%</td>
<td>25</td>
<td>0.65%</td>
<td>90</td>
<td>7</td>
</tr>
<tr>
<td>Italy</td>
<td>2</td>
<td>Veneza</td>
<td>2200</td>
<td>2057</td>
<td>24%</td>
<td>32</td>
<td>0.60%</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>Lorraine</td>
<td>1620</td>
<td>1724</td>
<td>16%</td>
<td>2</td>
<td>0.67%</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>France - Objective 3</td>
<td>10655</td>
<td>17174</td>
<td>14%</td>
<td>238</td>
<td>1.05%</td>
<td>220</td>
<td>14</td>
</tr>
<tr>
<td>UK</td>
<td>2</td>
<td>Wales</td>
<td>3837</td>
<td>1083</td>
<td>41%</td>
<td>40</td>
<td>1.00%</td>
<td>217</td>
<td>17</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
<td>Valencia</td>
<td>4173</td>
<td>3744</td>
<td>65%</td>
<td>143</td>
<td>2.47%</td>
<td>100</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spain - Compliments</td>
<td>13005</td>
<td>1792</td>
<td>12%</td>
<td>570</td>
<td>2.74%</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>Greece</td>
<td>2</td>
<td>Central Macedonia</td>
<td>1450</td>
<td>500</td>
<td>62%</td>
<td>12</td>
<td>0.79%</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greece - Transport</td>
<td>2657</td>
<td>1806</td>
<td>51%</td>
<td>18</td>
<td>0.66%</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Portugal</td>
<td>2</td>
<td>Alentejo</td>
<td>1988</td>
<td>1059</td>
<td>50%</td>
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<td>1.12%</td>
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