

*23 February 2012*

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# **Regional Innovation Monitor**

**Thematic Paper 3**

**Demand-side innovation policies at regional level**

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Demand-side innovation policies at regional level

UNU-MERIT (René Wintjes), 23 February 2012

In association with:  
Fraunhofer ISI & technopolis |group|

To the European Commission  
Enterprise and Industry Directorate-General  
Directorate D – Industrial Innovation and Mobility Industries

## **Preface**

The research for this report was undertaken by UNU-MERIT for Directorate-General for Enterprise and Industry in the framework of the project 'Regional Innovation Monitor' (Contract No. ENTR/09/32).

This RIM thematic paper is the product of desk research carried out between July and November 2011). It takes into account material from the RIM baseline regional profiles, innovation measures repository as well as the regional governance and policy survey which was all developed in the framework of the RIM project. The report has been written by René Wintjes (UNU-MERIT, Maastricht University).

The author wishes to thank all those who have provided comments on a draft of this paper, especially Jacek Walendowski and Henning Kroll.

RIM provides detailed information on regional innovation policies for 20 EU Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden and the United Kingdom. The core of the RIM service is a knowledge base of information on some 200 regions.

European Commission official responsible for the project is Alberto Licciardello ([Alberto.LICCIARDELLO@ec.europa.eu](mailto:Alberto.LICCIARDELLO@ec.europa.eu)).

For further information about the Regional Innovation Monitor and access to the full range of information on regional innovation policies, please visit the RIM website at: <http://www.rim-europa.eu>.

## **Disclaimer**

It should be noted that the content and conclusions of this report do not necessarily represent the views of the European Commission. The report is the responsibility of the author alone.



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# Executive Summary

Several recent studies report on the recent up-take of demand-side innovation policies, but they merely focus on the national policy level. Moreover, these studies focus on specific types of demand-side measures, such as regulation and standardisation, which may not be the most relevant policies to increase the demand for innovations at the regional level. This thematic paper of the Regional Innovation Monitor addresses demand-side innovation policies at regional level.

In the literature many authors have emphasised the importance of the demand-side of innovation. Involving users and interaction with public and or private users is essential for the dynamics in innovation systems. However, the implementation of targeted demand-side innovation policies is a rather recent trend.

This paper follows the most commonly used definition of demand-side innovation policies as formulated by Edler & Georghiou (2007, p.952): *“a set of public measures to increase the demand for innovations, to improve the conditions for the uptake of innovations or to improve the articulation of demand in order to spur innovations and the diffusion of innovations”*.

There is a general trend towards more demand-side innovation policy approaches at national and regional level. An important reason for the increase is in the effectiveness of demand-side policies for addressing societal challenges.

We can conclude that it is difficult to make a very sharp, black and white distinction between demand-side and supply-side innovation policies. Most schemes have to some extent an element of both.

Regulation and standardisation are not very common demand-side innovation policies at regional level. Most current regional policies that promote innovative demand are systemic policies and measures stimulating private demand for innovations.

At national level there is a strong, recent focus on innovative public procurement and pre-commercial procurement. Programmes, which promote public procurement of R&D or innovations, are less well represented at regional level, but many regions participate in the increasing number of national programmes.

There is still a large under-used potential at regional level regarding innovative procurement. Since a large part of public spending is done at the sub-national level, a large potential exists for every region to increase the regional demand for innovations by promoting the public procurement of innovative goods and services.

Increasing innovative procurement and pre-commercial procurement requires establishing strong incentives, administrative reform, training, exchange of experiences in national and European networks, and ‘learning-by-doing’.

In order to learn from policy interventions, and improve and diffuse practices, it is necessary to have evaluations and impact assessments of the implemented demand-side innovation policies, which are currently lacking.

The costs of a single case of innovative public procurement following a certain tender procedure (e.g. Forward Commitment Procurement), can be reduced by implementing programmes in which a number of procurement cases are supported following the same tender procedure. More programmes are needed, but they do not necessary have to be implemented at the regional level. For promoting public procurement of R&D, national programmes in which regions can participate, can sometimes be more appropriate.

Also at the regional level the variety of measures is large and there is an overlap which makes it hard to apply a strictly separate assessment and classification, but reviewing the current practices as reported in the Regional Innovation Monitor allowed for distinguishing four types of demand-side innovation policies at regional level: promoting public procurement of R&D; public procurement of innovative goods and services; systemic policies and policies that stimulate private demand for innovations.

Two important elements of demand-side innovation policies are: better articulation of needs and interaction with intermediate and end-users. Systemic policies at regional level, especially the increasingly popular ‘Living-labs’, are successful on both these elements.

Whereas systemic policies are very useful tools in Smart Specialisation Strategies and for developing ‘lead markets’, the more generic instruments of ‘stimulating private demand’ are very relevant for diffusing existing innovations. They are therefore more appropriate for ‘catching-up’ strategies, especially concerning the application of General Purpose Technologies (such as ICT or ‘green technologies’) for which a region could be ‘lagging behind’.

Increasingly demand-side innovation policies at regional level consist of a combination or package of measures. Examples of such a demand-side policy mixes are evidenced in systemic policies where for instance ‘Living-labs’ enter into public procurement programmes. Other examples in the RIM-database are public procurement policies that are preceded or followed-up by demonstration projects or innovation platforms.

Regions would benefit to a large extent from more innovative demand from public procurers in their daily procurement activities. Promoting innovative procurement is relevant for all regions. Promoting the procurement of R&D with dedicated regional Pre-Commercial Procurement programmes may not be relevant for each and every region, e.g.: for regions with a low autonomy. For some countries it seems more appropriate when regions participate in national or EU-wide sector programmes to promote PCP.

In order to further strengthen the public sector demand for innovations, it might be enough for some regions when national programmes for public procurement try harder to include and support also regional and local administrations concerning public procurement of innovation. Alternatively, e.g. for the regions with high level of autonomy, it might be good to implement their own public procurement and pre-commercial procurement policy programme at the regional level. Currently the lack of expertise and experience concerning such policies are a major barrier to wider implementation at regional level.

Another option is to increase and integrate the aspect of innovative public procurement in the existing and more successful type of demand-side policies. This could strengthen the role of governments as partners and users in system policies and as partners in policies stimulating private demand. This would also call for a more strategic role of regional and local governments and a better articulation of the regional public needs. Cooperation with other regions, which share the same public (sector) challenge, should also be promoted. This more strategic role and better articulation of regional needs could facilitate the development and implementation of more targeted Smart Specialisation Strategies.



## 1. Introduction

For many years the attention of policy makers has gradually shifted from supply-side policies towards more systemic innovation policies. More recently demand-side innovation policies receive increased attention. This trend goes beyond the traditional shift from merely supporting research in the science sector to supporting innovation in the private sector. Demand-side innovation policy measures increase the demand for innovations: by involving users, public procurement, improving the articulation of demand, supporting the up-take, and promoting adoption and diffusion of innovations. This trend also refers to policy addressing the demand for innovation in public sectors, innovation policy addressing needs of society e.g. regarding environment. Also the mode of support of demand side-policies has specific features, e.g. involving public procurement, regulation, standardisation, Public-Private innovation Partnerships, or in the form of policy-packages such as Lead Market Initiatives. Also thematic or sectoral innovation programmes, technology platforms, cluster policies and demand oriented foresight are tools which can be used to improve the articulation of needs and to promote interaction with users in meeting those needs. For enhancing the up-take and diffusion of certain existing technologies and innovations we can also think of awareness raising campaigns, demonstration projects, and provision of advice from innovation agencies.

There are some recent studies and reports addressing demand-side innovation policies, but they merely focus on the national policy level (OECD 2011; Cunningham 2009 and Iszak & Edler 2011), and do not address policies at regional level. Moreover, these studies focus on specific types of demand-side measures, such as public procurement, regulation and standardisation, which may not be the most relevant demand-side policies at the regional level. A first question therefore is whether demand based innovation policies exist at regional level? And which types of demand-side innovation measures seem to be most relevant at the regional level? This thematic paper analyzes and reports on the trends at regional level based on the data available within the RIM (Regional Innovation Monitor), including survey data and regional reports.

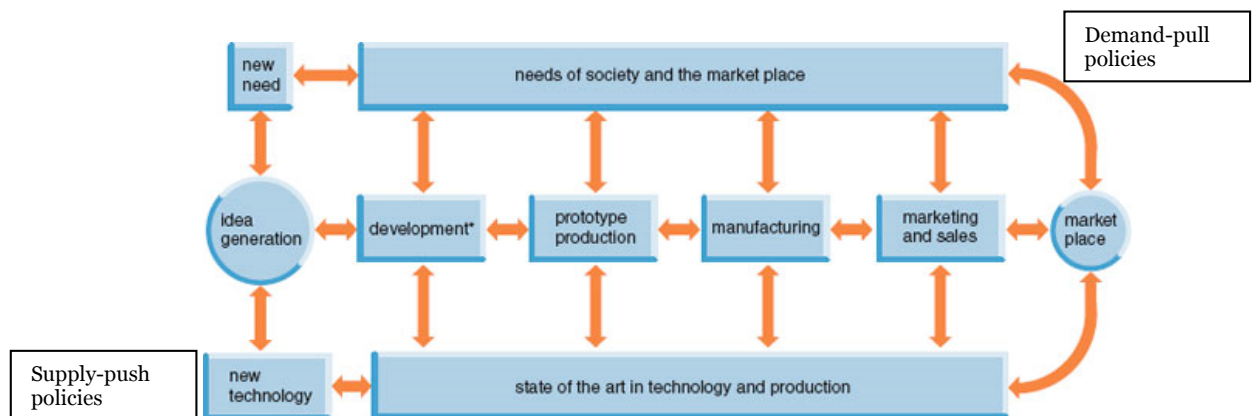
## 2. The concept of demand-side innovation policies

### 2.1 Emphasis on the role of demand for innovation in the literature

Stressing the importance of demand for innovation and the role of users in innovation processes is not new. Many authors have emphasised the importance of demand in order to broaden the concept of innovation from a linear, supply driven model of innovation to more systemic concepts emphasising the interaction between supply and demand for technology and innovation (von Hippel, 1976; Mowery and Rosenberg, 1979). Freeman (1982) emphasised that successful innovations are based on knowledge about the needs of potential users. Kline & Rosenberg (1986) point out that innovation is a process that does not stop after market introduction; subsequent improvements may be more important (economically) than the initial availability of an innovation in its original form.

Demand was also one of the factors in the Diamond model of Porter (1990) on the competitive advantage of nations, and the model on clusters. Specific demand conditions can sometimes explain the rise of competitive advantage of firms in a specific country, region or cluster in the same way that lead markets can do. Also Lundvall (1992), another ‘father’ of the concept of National Innovation Systems, has emphasised the importance of the demand for innovation, in particular the interaction between (potential) users and (potential) producers of innovations, and the fact that the public sector is an important user of new products and services. Moreover, public governments can influence the rate and direction of innovations through regulations and standards. The application in territorial concepts such as clusters or national or regional innovation systems is very relevant for this paper because of its focus on the regional perspective.

Figure 2-1 The coupling model of innovation



Source: adapted from Rothwell and Zegveld, 1985.

Another systemic model of innovation, which is also developed by authors who have emphasised the importance of demand, is the ‘coupling model’ of innovation from Rothwell and Zegveld (1985). The model shows the many linkages between the needs of society and the development and use of new technologies along the innovation value chain (Figure 2-1). The ‘coupling model’ of Figure 2-1 refers to manufacturing, but the role of demand in driving innovation is also evident in service sectors, since the interaction with the user is often part of delivering services, e.g. in most business services, and public services. Although we can place demand-side policies and supply-side policies at opposite sides in schematic system frameworks, as is done in Figure 2-1, it also is apparent that a very sharp distinction between supply and demand policy measures is difficult to make.

Although the literature on systems of innovation has been widely adopted in policy circles, it is only recently that specific attention to more targeted demand-side policy measures has increased. Edler (2009) even states that: “the demand side has long been systematically neglected in innovation systems analysis and subsequently in concepts and practice of innovation policy-making (Edler 2009, p.2)”.

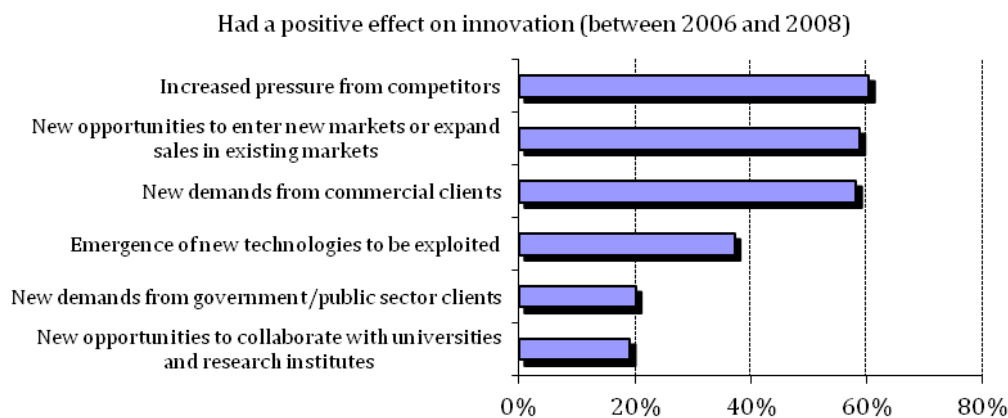
Policy makers have for a long time favoured the linear rational and the arguments on the supply side: an increase in R&D would lead to more inventions and patents which would lead to more successful innovations and economic growth. Typical examples of supply-side or technology push policies are: public funded R&D and R&D tax credits.

One of the explanations for the limited use of targeted demand side measures could be that many governments have historically tended to rely on macroeconomic policies and framework conditions to support market demand and avoid distortion; “Much of the role of government on the demand side of innovation has focused on ‘getting prices right’” (OECD, 2011).

One of the most direct and targeted forms of demand-side innovation policy is public procurement. Rothwell and Zegveld (1981) compared R&D subsidies and state procurement and concluded that public procurement generated larger innovation impact and in more areas than R&D subsidies did. Also Geroski (1990) concludes that procurement policy is more efficient in stimulating innovation than R&D subsidies. Aschhoff & Sofka (2009) found that public technology procurement as well as the provision of a knowledge infrastructure in universities have similar impacts on innovation, but the impact of public procurement was not equally distributed as it seems most effective when directed at smaller firms and in economically challenged regions. An often-mentioned fact in emphasizing the potential of public procurement policy is the large volume since public procurement accounts about 17% of the EU’s GDP (EC, 2010).

From the Innobarometer 2009 (Figure 2-2) we learn that ‘new demands from commercial clients’ had a positive effect on innovation for almost 60% of all innovating firms. New demand from government/public sector clients was ticked by about 20% of the innovating firms as having a positive effect on innovation. A positive effect on innovation from ‘new opportunities to collaborate with universities and research institutes’ is also reported by about 20%. So, private demand is more important for innovative firms than public demand, but the importance of new demand from the public sector seems similar to the importance of new opportunities to collaborate with universities and research institutes. Considering the large share of policies addressing collaboration between firms and universities, public procurement seems indeed an underinvested policy area within innovation policy.

Figure 2-2 External factors which have a positive impact on innovation in firms



Source: Innobarometer 2009; Note: innovative firms only.

Moreover, not only the supplying firms can benefit from public procurement. Also the quality and efficiency of the public sector in an economy can benefit from buying innovations, e.g. by using ICT innovations the public sector could become more efficient in providing public services. Another possible public benefit of demanding and using innovations is in addressing societal needs. Addressing societal challenges is therefore an important rationale for demand-side innovation policy. A possible reason why innovative public procurement policies are not more widespread might relate to negative connotations of the past when traditional industry policy was used for protecting declining sectors or as a ‘picking winners’ strategy. When public procurement, or lead markets is used to address societal needs this tension is less problematic, but still, there is a tension when for instance only local or regional suppliers of innovations are considered, or when there are competing technological solutions.

In recent years, according to the OECD (2011) report on demand-side innovation policy, many countries have used more targeted demand-side innovation policies “to address market and system failures in areas in which social needs are pressing”. According to the report this trend of increasing demand-side policies should be seen as “part of an evolution from a linear model of innovation, usually focused on R&D, to a more broad-based approach that considers the full scope of the innovation cycle” (OECD, 2011, p.9).

## 2.2 Definition, rationale and typology of demand-side policy measures

A broad-based approach considering the full scope of innovation cycles and value chains, makes it difficult to define demand-side policies, and for instance to make a clear distinction with supply-side measures. Moreover, many authors, who have emphasized the importance of the demand-side, have also stressed the importance of complementarities and matching the supply- and demand-side and the importance of promoting interaction between users and suppliers of innovations with systemic policies measures.

The most commonly used definition (OECD 2011; Cunningham 2009; Izsak & Edler 2011) of demand-side innovation policies was provided by Edler & Georghiou (2007, p.952): “*a set of public measures to increase the demand for innovations, to improve the conditions for the uptake of innovations or to improve the articulation of demand in order to spur innovations and the diffusion of innovations*”.

This definition includes two rationales for public intervention: the stimulation to come up with new innovations and the diffusion of existing innovations, which can be seen as demand-pull and demand-push respectively. Including the aspect of ‘improving the articulation of demand’ in the definition is very important since it refers to the uncertainty and risks associated with new demand and latent needs which calls for the coordination and alignment among potential users and for interaction between users and producers of innovations. What is not included in this definition is the geographical specification of demand: do the measures only target demand, uptake and diffusion within the administrative borders of the concerning (European, national or regional) government? Or do also the policies, which support export and internationalisation of innovative firms, fall under this definition of demand-side policies? Moreover, the definition also doesn’t provide a geographical specification regarding diffusion or the location of the suppliers of innovations. We will come back to this issue later, when we discuss the rationale and objectives of demand-side innovation policies at regional level.

Recent studies also often refer to the taxonomy provided by Edler (2007) and Edler & Georghiou (2007), which separate supply-side policies from demand-side policies. Their taxonomy includes 7 groups of supply-side measures and four groups of demand-side policies: systemic policies, regulation, public procurement, and stimulation of private demand. Systemic policies are included in the demand-side category because of their critical role in bringing users and suppliers together. Under this heading Edler & Georghiou (2007, p.953) mention ‘Cluster policies’ and ‘Supply

chain policies'. As with any taxonomy it is a simplification of reality, but the strict separation between supply-side measures and demand-side measures and the limited role for systemic policies can be questioned. Take for instance collaborative innovation programmes, which involve cooperation with industrial users; Or thematic public R&D programmes which have well articulated objectives regarding societal challenges. According to the taxonomy of Edler & Georghiou (2007) all grants for R&D are supply-side policies, but in the first phases of R&D procurement programmes (e.g. the SBIR programme implemented in the Netherlands), are in fact very similar to grants for R&D, as commercial procurement of a good or service is only applied in possible later phases (See also Figure 2-3).

Table 2-1 Categorisation of demand-side policies

| <b>Demand side innovation policy tool</b>  | <b>Short description</b>  |
|--|---|
| <b>Public procurement</b>  |   |
| Public procurement of innovative goods and services  | Public procurement of innovative goods and services relies on inducing innovation by specifying levels of performance or functionality that are not achievable with 'off-the-shelf' solutions and hence require an innovation to meet the demand.   |
| Public procurement of R&D  | These programmes support suppliers of innovations by procuring R&D services. Governments articulate a specific need, call for R&D proposals and select among the competing tenders. Various models for tender procedures can be used. Most recent programmes use the PCP (Pre-Commercial Procurement) approach.                                   |
| <b>Regulation</b>  |   |
| Use of regulations   | Use of regulation for innovation purposes is when governments collaborate broadly with industry and non-government organisations to formulate a new regulation that is formed to encourage a certain innovative behaviour.  |
| Standardisation  | Standardisation is a voluntary cooperation among industry, consumers, public authorities and other interested parties for the development of technical specifications based on consensus. Dynamic standardisation is an important enabler of innovation.  |
| <b>Supporting private demand</b>   |   |
| Demand subsidies   | The purchase of innovative technologies by private or industrial demanders is directly subsidised.  |
| Tax incentives   | Tax incentives can increase the demand for novelties and innovation by offering reductions on specific purchases.   |
| Articulation and foresight   | Societal groups, potential consumers and public and industrial users are given voice in the market place, signals as to future preferences (and fears) are articulated and signalled to the marketplace, including demand based foresight.  |
| Catalytic procurement  | Catalytic procurement involves the combination of private demand measures with public procurement where the needs of private buyers are systemically ascertained. The government acts here as 'ice-breaker' in order to mobilise private demand.  |
| Awareness raising campaigns  | Awareness raising actions and demonstration projects promoting private demand have the role to bridge the information gap consumers of innovation have about the security and the quality of a novelty.   |
| <b>Systemic policies</b>   |   |
| Cluster policies, support to user-driven innovation, Sector-, technology-, or theme-specific platforms | Policies that try to influence the development of the innovation system by stimulating dialogue between users, producers and other innovation actors, so as to increase their levels of coordination and cooperation and promote innovation and subsequent take-up.   |
| Lead market initiatives  | Lead market initiatives support the emergence of lead markets. A lead market is the market of a product or service in a given geographical area, where the diffusion process of an internationally successful innovation (technological or non-technological) first took off and is sustained and expanded through a range of different policies. |

Source: after Izsak & Edler (2011, p.11), and Edler 2009.

Under the heading of Systemic policies Cunningham (2009, p.3) also classifies: “Combination of supply-side instruments (R&D programmes) and demand-side impulses for selected technologies or services”. In the modified typology of Izsak & Edler (2011, p.11) Lead Markets, which combines several demand-side measures, are mentioned under the heading of systemic policies (see Table 2-1). The OECD (2011) report more or less avoids this middle category in between supply- and demand-side policies and is focused on public procurement and regulation.

The above mentioned classification attempts show that it is difficult to strictly separate policy measures into two groups, and to classify them either as supply-, or as demand-side policy measure. An important reason for this is that many innovation programmes consist of combinations of several types of intervention. Involvement of users (public or private) and articulation of demand are perhaps the most central common features of demand-side innovation policies.

### 2.3 Recent uptake of demand-side policies at EU-level and national level

As mentioned above the negative connotation of traditional industrial policy seems one of the explanations why targeted demand side policies regarding public procurement and regulation have not been implemented more often in the past. One of the reasons for the recent uptake of demand-side policies has been a change in industrial policy. In the new industrial policy of the European Union<sup>1</sup> competitiveness and sustainability are at the centre and the link between the two is expressed in terms such as targeting innovative competitiveness. As stated in the Lund Declaration<sup>2</sup>: “The identification of major challenges must involve the relevant stakeholders, including European institutions, business, public sector, NGOs and the scientific community”. Under the new industrial policy several policy options for smart growth (linking innovation policy and industrial policy) are emphasised which can be used to address grand social and environmental challenges.

The increased relevance of demand-side measures is recently highlighted by the “Innovation Union Flagship” Commission Communication (EC, 2010): “the potential of the single market should also be activated through policies that stimulate the demand for innovation”, moreover it states that a “bolder approach associating the supply and demand sides is needed”. Public procurement of innovative products and services is even mentioned as one of the ten key goals of the Innovation Union, but also other demand oriented policy goals are included:

- ‘European Innovation Partnerships will mobilize stakeholders;
- A pilot Partnership on active and healthy ageing;
- A major research programme on public sector and social innovation;
- Public procurement of innovative products and services.

With the concept of Innovative Partnerships a next step has been taken in the direction that has been set by for instance the European Technology Platforms, and the Lead Market Initiative.

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<sup>1</sup> EC (2010) An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage SEC (2010) 1276. See: [http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/files/communication\\_on\\_industrial\\_policy\\_en.pdf](http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/files/communication_on_industrial_policy_en.pdf)

<sup>2</sup> The Lund Declaration (SE), adopted in 2009 at the ‘New Worlds – New Solutions’ conference, stipulates that the EU must identify the major challenges for which public and private research need to develop sustainable solutions.

The European Technology Platforms bring together the most sector-relevant stakeholders (industry, public research, finance, (end-) users, policy-makers and regulatory authorities) in order to address specific innovation challenges and to create a coherent action plan to optimize the benefits for the actors involved. European Technology Platforms focus on areas, which are of social as well as industrial relevance, covering the complete value chain and thus activating national and regional authorities. The following European Technology Platforms have proven to be important in the design of research and innovation policies especially by representing the needs of users:

- European Biofuels TP;
- European Construction TP;
- European Steel TP;
- Forest-based sector TP;
- European TP on Sustainable Mine;
- Sustainable Nuclear Energy TP;
- European Wind Energy TP;
- Water Supply and Sanitation European TP.

With the involvement of public and private users such technology platforms can no longer be seen as supply-oriented. The development and inclusion of more targeted instruments of industrial policy and demand-side innovation policies have taken place with the Lead Market Initiative. It is a good example of a demand-side innovation policy measure, which integrates both innovation policy tools and industrial policy tools. The Lead Market Initiative includes various instruments, such as 'the legal and regulatory framework, fostering of open-innovation mechanisms, standards, public procurement practices, intellectual property protection, or the availability of venture capital'. The lead markets approach is holistic in the sense that it can involve any relevant kind of innovation support, but be applied to a very specific prioritised 'market'. A characteristic of a lead market is that the uptake of innovations may not be due to technological superiority, but to the ability of market players (industry, consumers and government) to influence its adoption. The applied technologies may even originate from elsewhere. The LMI approach was applied to: eHealth, protective textiles, sustainable construction, bio-based products, recycling, and renewable energies.

Results from the Innobarometer 2009 indicate the limited use of public procurement for innovation purposes: Between 64% and 77% of companies interested in public procurement report that none of the opportunities (investigated, unsuccessful bids made, contracts won) provided the chance to offer innovative products and services. Moreover, 30% of companies across Europe consider that cost is more important than innovation (9%) in winning public tenders.

The limited use of innovative public procurement is a result of various factors: public procurers favour low-risk solutions; limited knowledge and capabilities regarding procurement of innovations; and a lack of awareness regarding the possible impact of procurement on policy objectives. Camerer and Van Eijl (2011) also show that public procurement markets in Europe remain fragmented since only 3.7% of all public procurement in Europe is done across borders.

Regarding the national policy level, an INNO Policy TrendChart policy brief on Demand-side policies concludes in 2009 that: *"debate on lead market and demand-side policies is growing and is already well established by a number of the EU's innovation leaders [...] this policy focus is deepening and is also becoming broader across the EU 27"*, Cunningham (2009, p.11).

The most significant areas for demand-side policies are environmental technologies and ICT, but also the areas of health, transport and construction are prominent. According to Cunningham (2009) it seemed that the EU's Lead Market Initiative has had limited impact in terms of inspiring new initiatives at the national level. Cunningham (2009) also identified that where relevant Lead Market Initiatives or other demand-side initiatives are in place, most are run at the national level, with the exceptions of Austria, Denmark, Spain and UK, for which also regional initiatives were reported.

In a study concerning the state of play of demand-side innovation policies in Central Eastern European countries Edler (2009) concluded that “despite high hopes, not much systematic policy design and implementation happened so far, not at the EU level and not at Member States level, neither in old Member States nor in new ones”.

Relatively new, but increasingly popular policy instruments are those that promote the public procurement of R&D. There are several different legal tender procedures, including: ‘competitive dialogue’, ‘pre-commercial procurement’, ‘negotiated procedure’, ‘design contest’, and ‘framework agreement’. Each of these approaches has specific advantages and disadvantages according to the specific situation<sup>3</sup>. One type of policy support concerns the provision of information on such specific public procurement procedures (e.g., the Dutch Public Procurement Expertise Centre: PIANO<sup>4</sup>). In case a public procurer makes use of a certain tender procedure for a single procurement there are considerable costs in solving legal and organisational issues. Implementing a programme following a common procedure reduces such costs. Concerning public procurement of R&D two types of programmes exist. One type includes the two older programmes in the UK and the Netherlands which are inspired by the Small Business Innovation Research (SBIR) programme in the US. Most recent programmes follow the EC directive on Pre-Commercial Procurement (EC 2007b). The general process is as follows: government authorities articulate a specific need for which no current solution is available, they call for R&D proposals and select among the competing bids in several phases (Figure 2-3). The supply-side element of this instrument is that it supports R&D activities of suppliers. The demand-side element relates to the targeted articulation of demand. During the process, the interaction between the user and the competing suppliers is restricted, but this differs between the different procedures. Although most programmes, which promote Pre-Commercial Procurement (PCP), are in initial phase and have not yet been evaluated, a main difficulty of the approach seems to be that it hardly ever leads to the commercial phase of actual public purchasing of the product developed.

The results of an EC survey done in 2010 on the status of implementation of Pre-Commercial Procurement show that almost every EU Member State is at least exploring the possibilities or developing a framework (EC 2011).

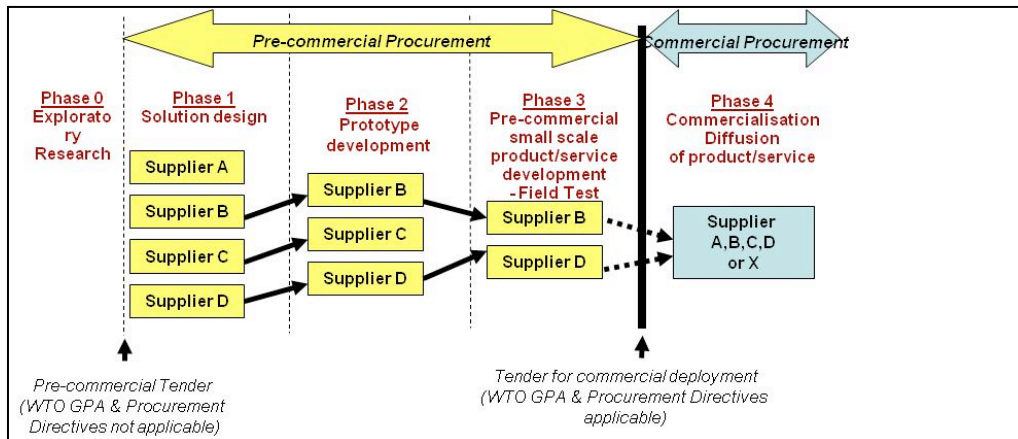
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<sup>3</sup> For a comparison between the different tender procedures, see Sloth (2011) and Müller (2009).

<sup>4</sup> Link: <http://www.pianoo.nl/about-pianoo>



Figure 2-3 Schematic overview of different phases in Pre-commercial Procurement



Source: EC (2007b).

The OECD (2011) report on demand-side innovation policies mentioned that responses from countries to the OECD Science, Technology and Industry Outlook 2010 policy questionnaire (Table 2-2) indicate that demand-side innovation policies were still not among the highest priorities. However, based on the 2011 TrendChart mini country reports (which include a section on demand-side policy) Izsak & Edler (2011) report on the increased up-take of demand-side innovation policies across Europe. They identify three groups of countries (Table 2-2). The group of countries with ‘Strong policy discourse and experience’ in demand-side innovation policies consists of: Germany, Finland, Denmark, Belgium (Flanders), Sweden, UK, The Netherlands and Norway. But also in other countries they observe a wide variety of experiments and pilot projects to test new approaches, which have just started or are being planned. They observe a strong focus on innovative public procurement, widespread interest in pre-commercial procurement and a focus on ‘green technologies’. They also found indications of more systemic policies, which often consist of a mix of instruments. Izsak & Edler (2011) conclude that: “demand-side innovation policy has become an explicit part of recent innovation strategies even if it is often not labelled as such”. They also show that many countries mention the importance of demand-side innovation policy in their recent strategy documents, but the lack of experience and expertise slows the translation of policy discourse into concrete policy measures.

Table 2-2 Level of priority (2010) and up-take (2011) of demand-side innovation policies at national level

| Level of priority in 2010*                    | Country  |
|---|--|
| High priority (8)                             | Finland, Spain   |
| Medium-high priority (6-7)                    | Austria, Norway, Slovenia  |
| Medium priority (4-5)                         | Germany, Hungary, Netherlands, Sweden  |
| Medium-low priority (1-3)                     | Denmark, France  |
| Strong policy discourse and experience        | Germany, Finland, Denmark, Belgium (Flanders), Sweden, UK, The Netherlands, Norway |
| Relevant policy discourse and experimentation | Austria, Ireland, Portugal, Spain, Italy, Iceland, Poland, Malta, Czech Republic   |
| Limited policy discourse and/or actions       | Hungary, Greece, Lithuania, France, Luxembourg                                     |

Source: \*OECD (2011, p.30); Note: Based on self-reported country responses in 2010 on a scale of 1 to 8 (0 suggests it is not important and 8 very important in the new national STI strategies). \*\* Izsak & Edler (2011) based on TrendChart mini country reports, which included a section on demand-side policy.

The OECD report has its focus on only a limited set of demand-side policies at national level, namely: procurement, regulation and standardisation. The examples mentioned in the TrendChart mini country reports and the OECD Report (see Appendix B for a selection) show that there is a large diversity of measures, even when a narrow focus is applied. Based on the 2011 TrendChart mini country reports the recently most popular measures seem to be in the area of innovative public procurement for which there are existing or planned schemes in 13 countries and concerning pre-commercial public procurement for which there are existing and planned measures in nine countries.

Conclusions and recommendations derived from the above-mentioned studies on demand-side policies at national level include:

- There is a general trend towards more demand-side innovation policy approaches, but countries have adopted measures to different degrees and follow different approaches;
- Government should better assess the rationale for policy intervention.
- The policy intelligence should be backed by (currently lacking) evaluations and impact assessment of implemented policies;
- There exists significant potential to boost demand for innovation by increasing the innovation capacity of the public sector to meet societal challenges;
- There is a strong, recent focus on innovative public procurement and pre-commercial procurement;
- Demand-side innovation policies need to be matched and combined with adequate supply-side policies and measures. There are indications of such a trend in the increase of systemic policies;
- Mobilising public administrations in favour of innovation through demand-side measures requires establishing strong incentives, administrative reform, upgrading competencies of human resources, and exchange of experiences in national and European networks;
- The costs of a single case of innovative public procurement following a certain tender procedure (e.g. Forward Commitment Procurement), can be reduced by implementing programmes in which a number of procurement cases are supported following the same tender procedure;
- The EU can play a catalytic role, provide a test bed and promote the uptake and diffusion of new demand-side innovation policies (as was done regarding pre-commercial procurement and lead markets).

### 3. Demand-side innovation policies at regional level

#### 3.1 The rationale of demand-side innovation policies at regional level

There are several reasons for public intervention with demand-side innovation policy according to the potential impacts. Concerning the rationale there are some differences between the national and regional level of policy. For instance, in the definition of demand-side innovation policies (as mentioned in section 2.2) no reference is made to any geographical specification concerning the demand that is to be increased. However, as part of a territorial strategy to enhance the innovative competitiveness of a region, demand-side innovation policies should consider the location of both the concerning demand and supply.

The rationale for demand-side innovation policies at regional level rest on several potential impacts:

- Better articulation of (public, industrial, consumer) needs in the region can reduce the uncertainties and risks for potential regional suppliers and stimulate them to develop (more) innovations;
- Effective innovative (public, industrial and consumer) demand can stimulate regional suppliers to develop, produce, and sell (more) innovative goods and services, and it can generate start-up's;
- Increased use and application of innovations in industry can generate regional growth and enhance productivity in the business sector;
- Increased use of innovations in the public sector can enhance the performance of public services in a region and increase the efficiency of the public sector (e.g. the procurement of ICT for e-government);
- Innovative public and/or private demand can help in addressing societal challenges (e.g. applying energy innovations supporting goals for CO<sub>2</sub> reduction).
- Promoting interaction between co-located (end-) users and producers of innovation can generate localised learning and agglomeration dynamics in regional innovation systems and serve to implement strategies to increase competitiveness (e.g. smart specialisation strategies and lead market initiatives).

The last argument regarding localised learning and agglomeration dynamics seems especially relevant at the regional level. But also for the other mentioned rationales or potential policy impacts it is relevant to specify the location of the users and/or suppliers of innovation. Because some of the impacts or benefits of demand-side innovation policies are for the supplying firms, it can be used as regional industrial policy, e.g. in the form of lead-market-initiatives. However, not every policy instrument and not every country will allow to favour suppliers in the region and exclude suppliers from other regions (e.g. in a public procurement procedure).

More in general, the most appropriate level of governance for supply-side policies and demand-side policies seem to differ. For the governance of research excellence the trend is shifting from the national policy level of the Member States towards the European level of the European Research Area (Nauwelaers and Wintjes, 2009), e.g. in order to overcome the fragmentation on the supply-side. On the other hand, at regional level, absorption and application of technology and innovations is more important than hosting basic research and the capability to produce patents (Wintjes & Hollanders 2010). Regional innovation policies should effectively become complements for European Research Area policies: *“focusing less on research excellence in abstracto, but more on local innovation application ...”* (Soete 2008, p.5) in line with the ideas of ‘smart specialisation’, as formulated by Foray and van Ark (2007).

In this respect, the European level of governance seems most appropriate for supply-side R&D policies, while the national and regional level seem to be most appropriate for implementing demand-side innovation policies. Supply-side measures could support the development of European Centres of research excellence, which operate at the technological frontier where new General Purpose Technologies in ICT, biotech and new materials are developed. This could be complemented with region-specific demand-side innovation policies, focusing on the absorption, application, up-take and diffusion of innovation (Braun et al. 2011), either following a ‘catching-up’ approach concerning markets which are ‘lagging behind’, or a ‘smart specialisation’ approach concerning ‘lead markets’.

The concept of ‘lead-markets’ adds a strategic component to demand-side innovation policies. Von Hippel (1982 and 1986) introduced the concept of ‘lead users’, which he defined as: “consumers whose present strong needs will become general in a marketplace months or years in the future” (von Hippel 1986, p.792). Regional Innovation Strategies could for instance include the development of strong needs and thus create a regional ‘lead-market’ as a way to construct a regional competitive advantage. As such, demand-side innovation policies can fulfil an important role in Smart Specialisation Strategies. At the higher policy levels of the European Union and of the individual countries, it is more difficult to select priorities and fields of specialisation. At regional level it is less difficult to accept that the region cannot excel in every field and has to set priorities.

### 3.2 Indications from the 2010 RIM survey of policies planned or implemented at regional level

This thematic RIM paper has the same methodological difficulties as the attempts at national level mentioned in section 2, to give an overview of the degree of uptake and implementation of demand-side innovation policies. The main difficulty is that the definition of demand-side policies leaves room for different interpretations. A second difficulty is in the fact that many demand-side policy initiatives and actions are not explicitly documented as a formal policy measure, programme or scheme. The method used is often to ask correspondents or policy makers in a survey. In this paragraph we provide an indication of the existence at regional policy level of demand-side policies based on the results of the Regional Innovation Monitor Survey, which was held in 2010 (See RIM annual report 2011)<sup>5</sup>.

From these survey results for 191 European regions it is estimated that in 2010 more than three out of five regions have not implemented or planned to implement demand-side innovation policies, while roughly about two fifths of regions have implemented or reported to have such plans (Table 3-1). Crosschecking with the 2011 TrendChart mini country reports and the RIM database suggests that the up-take of demand-side policies has increased since the time of the 2010 RIM survey.

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<sup>5</sup> Link: <http://www.rim-europa.eu/index.cfm?q=p.reportDetails&id=15138>

Table 3-1 Demand side policies at regional level

| <b>Policies</b>              | <b>Frequency</b>                                   | <b>Percent</b> |
|------------------------------|--|----------------|
| <b>None</b>                  | 122  | 63,9           |
| <b>Planned</b>               | 34   | 17,8           |
| <b>Implemented</b>           | 35   | 18,3           |
| <b>Total</b>                 | 191  | 100,0          |
| <b>Geographical coverage</b> |  |                |
| <b>None</b>                  | Regions of: CZ, FI, GR, FR, PL, UK, NL, AT, DE, IT |                |
| <b>Planned</b>               | Most regions of: BG, SK                            |                |
| <b>Implemented</b>           | Most regions of: DK, HU, BE                        |                |
| <b>Differentiated</b>        | Some regions have plans or implemented in: IE, PT  |                |

Source: RIM survey, 2010.

Again, it is only a rough estimation because of the likely differences in the interpretation of what a demand-side policy is and what is not. This difficulty regarding interpretation is less likely concerning promotion of public procurement as an innovation policy. In 2010 this more narrow type of demand-side innovation policy measure was less frequently implemented at regional level, namely in 22 out of the 191 regions (Table 3-2). Regional innovative public procurement measures could be found in Ireland, Belgium, Spain, Italy, Hungary and Sweden. The trend was already increasing, since the number of regions, which planned an innovation policy measure concerning public procurement, was with 32, larger than the 22, which had already implemented such a dedicated policy measure in 2010. Crosschecking with the 2011 TrendChart mini country reports and the RIM database, again suggests that the uptake has increased since the time of the 2010 RIM survey.

The survey refers to measures dedicated to innovative public procurement; the results do not imply that no innovative public procurement exist in regions without such dedicated regional programmes. First, regions could make use of information, know how, and support from initiatives taken at EU and national policy level. More importantly, also without the existence of programmes, public procurers can promote innovation in their daily purchasing and procurement activities, e.g.: by not asking for 'off-the-shelf' products and services, by not excluding innovative solutions, by not describing in detail what the product or service should look like. When procurement officers merely articulate the main functionalities of what they need, they leave room for the supply-chain to come up with innovative, better solutions. Moreover, besides price, additional award criteria can be applied to incorporate the value of societal benefits, e.g. in terms of CO<sub>2</sub> reduction or end-user satisfaction.

Table 3-2 Public procurement policies at regional level

| <b>Public procurement policies</b> | <b>Frequency</b>  | <b>Percent</b> |
|------------------------------------|---|----------------|
| <b>None</b>                        | 137   | 71,7           |
| <b>Planned</b>                     | 32  | 16,8           |
| <b>Implemented</b>                 | 22  | 11,5           |
| <b>Total</b>                       | 191   | 100,0          |
| <b>Geographical coverage</b>       |   |                |
| <b>None</b>                        | Regions in: CZ, UK, GR, AT, PL, SK                            |                |
| <b>Planned</b>                     | Most regions of: BG, PT                                       |                |
| <b>Implemented</b>                 | Most regions of IE  |                |
| <b>Differentiated</b>              | Some regions have plans or implemented in: BE, ES, IT, HU, SE |                |

Source: RIM survey, 2010.

The survey also included questions on several demand-side innovation policy measures, including: public procurement policies, cluster policies, ‘Eco-innovation policies’, and ‘Theme-based policies aimed at broader societal goals’.

Based on the up-take of the various policies we constructed a summary indicator. The three regions which have implemented all the concerning policies are the Swedish region Östra Sverige (which includes Stockholm), the Danish region Midtjylland, and the Spanish region La Rioja. Other regions with a high implementation rate of demand-side policies are located in Italy, Portugal, Denmark, Spain, and Belgium (Table 3-3).

Table 3-3 Summary indication for rate of implementation of various demand-side innovation policies at regional level

|                     | Demand-side policies | Public procurement policies | Cluster policies | Eco-innovation policies | Theme-based policies aimed at broader societal goals | Score/sum |
|---------------------|----------------------|-----------------------------|------------------|-------------------------|--|-----------|
| Östra Sverige (SE1) | 2                    | 2                           | 2                | 2                       | 2  | 10        |
| Midtjylland (DK04)  | 2                    | 2                           | 2                | 2                       | 2  | 10        |
| La Rioja (ES23)     | 2                    | 2                           | 2                | 2                       | 2  | 10        |
| Marche (ITE3)       | 2                    | 2                           | 2                | 2                       | 1  | 9         |
| Norte (PT11)        | 2                    | 1                           | 2                | 2                       | 2  | 9         |
| Algarve (PT15)      | 2                    | 1                           | 2                | 2                       | 2  | 9         |
| Vlaams Gewest (BE2) | 2                    | 2                           | 2                | 1                       | 2  | 9         |
| Centro (PT16)       | 2                    | 1                           | 2                | 2                       | 2  | 9         |
| Lazio (ITE4)        | 2                    | 1                           | 2                | 2                       | 2  | 9         |
| Syddanmark (DK03)   | 2                    | 2                           | 2                | 0                       | 2  | 8         |
| Cantabria (ES13)    | 2                    | 2                           | 2                | 1                       | 1  | 8         |
| Aragón (ES24)       | 2                    | 2                           | 2                | 1                       | 1  | 8         |
| Hovedstaden (DK01)  | 2                    | 2                           | 2                | 1                       | 0  | 7         |
| Sjælland (DK02)     | 2                    | 2                           | 2                | 1                       | 0  | 7         |

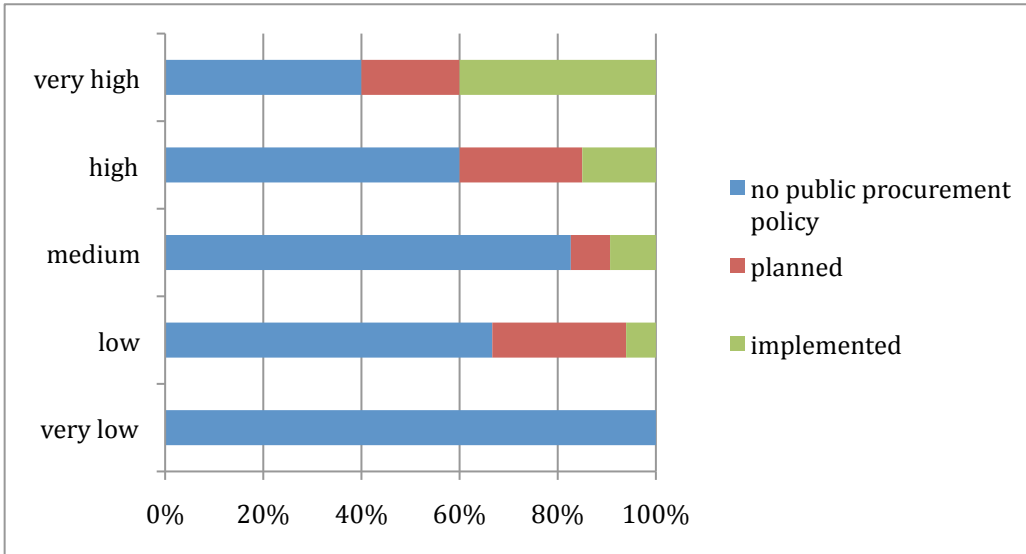
Source: RIM survey 2010.

Legend: 2= implemented, 1= planned, 0=neither implemented nor planned.

### 3.3 Barriers and drivers for demand-side innovation policy at regional level

One of the reasons why some types of demand-side innovation policy measures are not more widely implemented relates to the often more limited authority of the government at regional level. This is for instance the case regarding the implementation of public procurement policies, which are more frequently implemented in regions with higher autonomy (see Figure 3-1). Also the range of responsibilities at regional level and the existence of horizontal coordination mechanisms seem important conditions, which favour implementation of public procurement policies for innovation. When regions are responsible for policy fields covering many public sector services such as healthcare, environment, energy, transport, ICT and housing, it becomes more relevant to have a public procurement policy for innovation in place.

Figure 3-1 Share of regions having implemented or planned public procurement policies, by the level of autonomy regarding RTDI, ranging from very high to very low

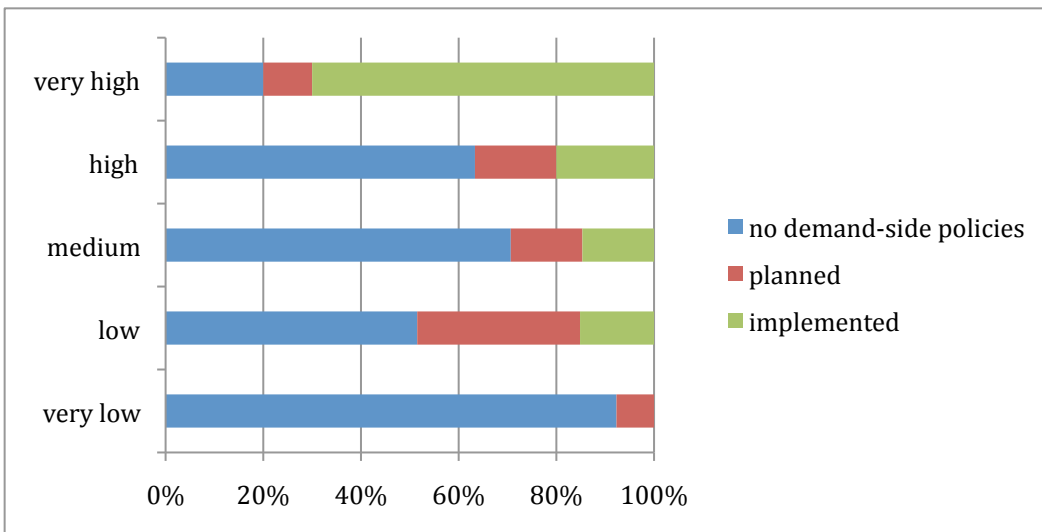


Note: the relation is statistically significant: Pearson Chi-Square = 24.493 (p = .002).

Also the relation between the shares of implementation of public sector innovation policies, by the level of autonomy regarding RTDI is significant, as well as for the implementation of demand-side policies in general (Figure 3-2).

Other barriers for implementation of especially public procurement policies for innovation, which are identified at national level, also apply at the regional level. E.g.: in general the culture of the public procurers at regional level is one of favouring low-risk solutions. The barrier regarding the limited knowledge and capabilities regarding procurement of innovations seems also to form a barrier, especially at regional level. Also the lack of awareness regarding the possible impact of procurement on policy objectives and the lack of good examples of policies in other regions seems to be a major barrier. In many ways the difference in scale between the national and regional governments seems to form barriers for public procurement of innovations at the lower level of government.

Figure 3-2 Share of regions having implemented or planned Demand-side innovation policies, by the level of autonomy regarding RTDI, ranging from very high to very low.



Note: the relation is statistically significant Pearson Chi-Square = 25.993 (p = .001).

### 3.4 Types of demand-side policies at regional level, overview and examples

In section 2 four groups of demand-side policies have been identified at the national policy level: public procurement, systemic policies, stimulation of private demand, and regulation. The regional policies of the RIM-database are analysed and screened for examples along these groups. The group of policies concerning regulation and standardisation hardly exists at regional level, so it will not be discussed here. Setting industry standards is often a national competence. Regarding public procurement as innovation policy a distinction is made between public procurement of innovative goods and services and public procurement of R&D services (in particular Pre-commercial Public Procurement). In this section an overview of existing policy schemes for these four types of demand-side innovation policies is given.

As Iszak and Edler (2011) have concluded at the national policy level, we have to conclude that also at the regional level most measures have not been evaluated. The selected examples must therefore not be seen as a collection of 'best practices'. The idea here is to provide an overview of current practices. Sometimes the examples have been selected and presented here because they represent a larger number of similar schemes.

#### 3.4.1 Policies promoting public procurement of R&D services

An example of an R&D procurement scheme, which is funded and implemented at regional level, is the new Pre-Commercial Procurement measure in Flanders (Box 3-1). Also the region South West of England and the Hungarian region Észak-Alföld have developed a similar Pre-Commercial Procurement programme. An interesting element in the case of Flanders is the use of innovation platforms before the actual Pre-Commercial Procurement (PCP) procedures starts. This actually implies bringing in a systemic policy instrument, since these innovation platforms facilitate the involvement of stakeholders and exchange between the supply- and demand-side, which is restricted once the PCP procedure has formally started.

##### Box 3-1 Flanders Action Plan on Public Procurement of Innovation (Flanders, BE2)

The Flemish government approved in 2008 this new scheme, which concerns a horizontal approach to pre-commercial procurement of R&D. This implies that the regional government buys innovation from companies and knowledge institutes in 13 different policy areas.

An Action Plan on Procurement of Innovation, which adopts horizontally integrated approaches, can help government to identify public demand and define purchasing needs, thereby enhancing the public commitment to procure innovative solutions from the private sector. Innovation platforms can contribute to the involvement of stakeholders and exchange of information between the demand and supply side through the process of decision-making, market consultation and technical dialogue. One of the lessons learned is that the procedures for pre-commercial R&D should take into account legal obligations linked to contracts and be kept open and transparent in order to be non discriminatory. See also OECD (2011, p115).

Programmes (and intentions) to promote PCP have recently become widespread at the national policy level. So far, not many regions have implemented their own programme dedicated to promote PCP within their administrative borders, but regions can also take part in European or national initiatives to promote PCP.



Examples of European initiatives include FP7 projects such as 'P3ITS'<sup>6</sup>, which stands for 'Pre-commercial procurement for ITS (Intelligent Transport Systems) innovation and deployment'. This European network of procurement experts and professionals from the ITS sector and public procurement agencies, also includes several regional partners, e.g. Bretagne and North Denmark. Another network with regional partners that was set up as a FP7 project is 'PRECO'<sup>7</sup>, which stands for 'Enhancing innovation in pre-commercial public purchasing'. Regional partners include for instance: Vysocina Kraj Region (CZ), Foundation of Community of Valencia (ES), Copenhagen Living Lab (DK), Amsterdam Innovation Motor (NL), and Union of the Chambers of Commerce of Veneto (IT).

Sweden, Czech Republic, Spain, and Italy have recently launched a national Pre-Commercial Procurement programme, but to some extent also regional authorities can apply or participate. In the case of the BETA programme in Czech Republic the public bodies, which can demand research, experimental development and innovation, are mainly the national Ministries. In the case of the Spanish Innovation Based Public Procurement, the guidelines and support also applies to the regional level. The national Italian Pre-Commercial Public Procurement measure is especially focused at the regional level. In October 2011, the Autonomous Province of Bolzano / Bozen (IT) has launched a first PCP call for tender to get radiotherapy appliances developed and supplied. The Italian PCP programme is an initiative of the Department for Cohesion Policies of the Italian Ministry of Economic Development and the National Agency for Innovation. This national programme should encourage regional ministries responsible for research and innovation to use EU Structural Funds for Pre-Commercial Public Procurement. It comprises of a first phase of dialogue between the regional ministry, the procurement authority and the potential users. The regional ministry finances the research and product development for 100% and the contracting authority only finances the actual procurement. It is not possible yet to draw conclusions on the successfulness of this new approach, but if it functions well, it could address and solve a common challenge of Pre-Commercial Procurement measures, namely committing the public contracting authority to actually purchase and roll out the developed product.

Besides PCP, regional public procurers also make use of alternative tender procedures concerning R&D, but mostly on an ad hoc basis and not in the form of a dedicated programme which supports a larger number of projects following the same model. An example is a 'Design Contest' procedure launched by the Province of Friesland (NL) as mentioned in a manual with practical lessons published by the Dutch Public Procurement Expertise Centre: PIANOo (2011, p.17). Although this single project was successful, the Province did not start a programme supporting a number of Design Contests. In case such a programme was considered, the national policy level would probably be more appropriate to launch such a programme.

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<sup>6</sup> <http://www.p3its.eu>

<sup>7</sup> <http://preco.share2solve.org/main/>

### Box 3-2 A Design Contest launched by a provincial authority to build a special bridge (Friesland, NL12)

In 2008 the province of Friesland launched a design contest for a new, movable bridge. Five parties were selected and paid to come up with a Preliminary Design (together with a cost estimate for further development, construction and 50 years of maintenance). The award criterion was 'most economically advantageous tender'; the price counted for 20% and the quality of the architectural design for 80%. The Province also gave room for innovation by not specifying in detail what kind of bridge they wanted. No restrictions were placed on the type of bridge, except that it had to be a movable bridge. The submitter of the winning design was happy it could try out a new material in a composite deck, which had never been used before for a heavy-duty bridge. Due to the innovative design the period between maintenance had been extended from 6 to 12 months. The winner of the contest developed the Final Design and most of the construction was put out to a national public tender. The bridge was taken into use in 2010. This tender procedure took a lot of time and effort: including the legal and procurement support; but these projects are important to show that the province is in favour of sustainability and innovation.

Link: <http://www.pianoo.nl/sites/default/files/documents/documents/practicallessonsdecember2011.pdf>

#### 3.4.2 Policies promoting public procurement of innovative goods and services

Regional schemes (funded and implemented at the regional level) fully targeted at public procurement of innovative goods and services are rare and recent. Several regions are planning pilots, or are studying the possibility to do so. But, again, regions can also participate in EU and national level initiatives to promote innovative public procurement at the regional level.

The SCI-Network connects public authorities in Europe looking to procure innovative and sustainable solutions within their construction projects. This network is co-financed by the European Commission's CIP programme under the Lead Market Initiative in which also regional and local partners are involved (e.g. London and Turin). Also the LCB-Healthcare<sup>8</sup> initiative is relevant for the regional and local level. It stimulates demand for innovative low-carbon solutions for the healthcare sector by providing procurement decision makers (mostly individual hospitals) with the knowledge and tools to achieve more sustainable buildings within their budget constraints.

Exchange of experiences between regions is very relevant in promoting and diffusing the use of innovative public procurement. EUROPROC is a EU funded project for Regional Cooperation for SMEs access to Public Procurement. It is focussed at the public procurement market at European level, and involves support to SMEs in regions, which have less experience and know-how regarding innovative public procurement. The EUROPROC project activities in the Bulgarian region Severozapaden<sup>9</sup> are focused on improving the competences of SMEs regarding the procurement process. Among the partners in this project are also regional innovation agencies and intermediaries that have a high level of expertise in public procurement procedures, which they share with participants in other regions.

In some countries, regional and local authorities can apply for the national procurement measures, e.g. in case of Finland. The national funding instrument to encourage the public procurement of innovation was launched by Tekes in 2009. The funding is targeted at all Contracting Authorities of the public sector. Tekes funds the preparation of public contracts aiming at renewal of services. The projects mainly focus on developing innovative services of local authorities in the social and health sector, or on sustainable development and energy efficiency (Box 3-3). Most applicants are cities that use this national Finnish project to develop operating models for procurement of innovations.

<sup>8</sup> Link: <http://lowcarbon-healthcare.eu/main/>

<sup>9</sup> See <http://www.rim-europa.eu/index.cfm?q=p.support&n=15366>

Box 3-3 Selection of regional projects funded by the Finnish national measure to promote procurement of innovations in the public sector

- Outsourcing of municipal engineering: City of Varkaus;
- New innovations and life-cycle targets for the operating environment in education and day care: City of Jyväskylä;
- Sheltered housing for the seriously disabled: City of Vantaa, social and health-care sector.

In the UK regional and local public procurers are informed and supported by BIS (Department for Business, Innovation & Skills), which for instance promotes Forward Commitment Procurement<sup>10</sup> (Box 3-4).

Box 3-4 Sustainable drainage for Wakefield Council by Forward Commitment Procurement (Wakefield, West Yorkshire, UKE4)

Many of the sports grounds in Wakefield suffer from persistent flooding. The Council identified a specific requirement for a cost effective, sustainable, and effective solution to long-term pitch maintenance. According to the Strategic Procurement Officer of Wakefield: “The Council was well aware that business as usual would not deliver these aspirations: new approaches and thinking would be needed. FCP (Forward Commitment Procurement) was the obvious way forward to help the estates team to stimulate the supply chain to come up with new ideas and adopt new technologies, and help us to present a business case for the improvements.” –. The Council issued a Prior Information Notice and set out its requirement in a Market Sounding Prospectus. A site visit was well attended by the supply chain and the information gathered enabled the team to go to the market with confidence that their outcome-based specification would get a good response. The formal procurement process began in March 2011. The evaluation criteria emphasised the importance of environmental and operational sustainability, innovation, and low carbon solutions.

Source: BIS (2011).

In the Netherlands regional and local procurement professionals can make use of the services of the Public Procurement Expertise Centre PIANO, which includes a help-desk, courses, publications, a virtual marketplace for tenderers and the organisation of several kinds of meetings, including regional meetings. Each spring and autumn meetings on a specific subject are organised for professionals in 4 or 5 regions.

Another type of innovative public procurement relates to investments in large technological infrastructures which is an indirect way of stimulating the demand for and use of related technologies and innovations, e.g. in the case of the procurement of an optical fibre route in the Autonomous Region Aosta Valley (Box 3-5). The region doesn't aim to become a leader in supplying optical fibre networks, but the procurement of this infrastructure will increase the demand for advanced e-government services and broadband services more in general, especially in parts of the region that currently lack access. Another case of a public procurement in Valle d'Aosta which is documented on the RIM website is the construction of a cogeneration heat station.

Box 3-5 Acquisition of optical fibre routes (Valle d'Aosta/Vallée d'Aoste, ITC2)

The measure follows the goals of the Regional Development Plan for Next Generation Networks (NGN) in the region. The action plans to implement a fibre optic network able to connect all telephone exchanges and all municipalities in the region. The goal is to enable the delivery of advanced services to public authorities, and to enable communication operators to provide broadband connectivity services even in municipalities that currently have no access to ADSL. In July 2009 the enterprise for the electricity owned by the Autonomous Region Aosta Valley, initiated the purchase and installation of the fibre optics to create a network.

Link: <http://www.rim-europa.eu/index.cfm?q=p.baseline&r=ITC2>

<sup>10</sup> <http://www.bis.gov.uk/policies/innovation/procurement/forward-commitment>

Overall, there are hardly any regional programmes fully dedicated to a larger number of projects of public procurement of innovation. Public procurement practices exist but they are either single, ad-hoc projects, or the procurement is part of a programme or initiative which includes a wider mix of policy support. For instance, in the case of an innovative mobility project in the Portuguese region Madeira (Box 3-6), procurement of goods is only a part of the project.

Box 3-6 CIVITAS MIMOSA (Autonomous region Madeira, PT30)

This project is about innovative and sustainable mobility in the city Funchal in the Portuguese autonomous region Madeira. The aims of CIVITAS MIMOSA are: to increase the total number of passengers and improve user satisfaction; to build up evaluation models, to increase the efficiency of the public transport system and to promote a positive attitudinal shift towards alternative transport modes (biking, walking, car sharing). The project is built on the results of several demonstration projects in the past. The core activity will be to set up an ICT-based public transport operational centre. New environmentally friendly mini-buses will be procured in order to improve the alignment of transport services to mobility needs, and to allow for instance the transport operator to provide services in neighbourhoods with narrow streets.

Link: [http://ec.europa.eu/regional\\_policy/cooperate/regions\\_for\\_economic\\_change/doc/regiostars/2011/regiostars2011.pdf](http://ec.europa.eu/regional_policy/cooperate/regions_for_economic_change/doc/regiostars/2011/regiostars2011.pdf)

Demonstration projects (which are classified under ‘Stimulation of private demand’: section 3.44) can have large impacts on the take-up of innovations, e.g., before or after a case of (commercial or pre-commercial) procurement; not only in the above case, but also in the case of the Hybrid Electric Fuel-Cell Bus project (Box 3-7). It shows that the various demand-side innovation policy measures or tools are often linked to each other in a certain mix of coherent policy activities.

Box 3-7 The Hybrid Electric Fuel-Cell Bus project (North Rhine-Westphalia, DEA)

This EU Regiostars awarded project aims at the development of a zero-emissions hybrid fuel-cell bus ready for series production, which will be used in future public transport systems. The “hydrogen bus” is an innovative approach to tomorrow’s local public transport, because it is clean and quiet, has ample passenger capacity with low energy consumption and zero emissions. The World’s first 18 m fuel-cell bus has been developed in the framework of the project. The bus is part of a series of test vehicles destined for local public transport services in Amsterdam and Cologne. The project was triggered by the government of the German State of North Rhine-Westphalia (NRW) with the Climate Protection Programme. One of the involved measures was the “NRW Hydrogen HyWay” to support the marketability of fuel-cell technology by initiating a considerable number of research and demonstration projects.

Link: [http://ec.europa.eu/regional\\_policy/cooperate/regions\\_for\\_economic\\_change/doc/regiostars/2011/regiostars2011.pdf](http://ec.europa.eu/regional_policy/cooperate/regions_for_economic_change/doc/regiostars/2011/regiostars2011.pdf)

A considerable category of measures at regional level is promoting the use of eco-innovations, but the role and attention given to public procurement is still rather limited. Green public procurement as a tool is often just one of the options (Box 3-8), next to other ways to enhance the use of eco-innovations such as: technology transfer, cluster policy, support for collaboration or public-private partnerships. Such projects or programmes, that include innovative procurement merely as one of the possibly relevant tools, would therefore better be classified under the next group of demand-side innovation policies: systemic policies.

Box 3-8 European Clusters and Regions for Eco-Innovation Network Plus (ECREIN+), (Yugoiztochen, BG34)

European Clusters and Regions for Eco-Innovation Network Plus (ECREIN+) builds on the results of the ECREIN project (See also <http://www.ecreinetwerk.eu/>). ECREIN focuses on increasing the awareness of existing financial instruments at the European, national and regional levels with the ultimate aim of becoming the main network for regional support of eco-innovation. ECREIN+ takes this forward by defining regional eco-innovation policies and practices with a wider application across European regions, including Green Public Procurement, technology transfer, cluster policies and eco-parks. The knowledge generation regarding eco-innovation policies and practices includes: market analysis for environmental goods and services, how institutions can be improved in order to support eco-innovation, and how efficiently such innovation policies function. The direct beneficiaries of the project include public administrations and business support institutions, with R&D institutions and small and medium sized businesses being the final beneficiaries.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=15298&r=BG34>

### 3.4.3 Systemic policies

Within the category of systemic policies the cluster policies form the largest share together with lead markets type of measures, which at regional level are hard to separate from each other, since these types seem to have converged.

Essential in this group of demand-side innovation policies is bringing together of buyers and suppliers of innovations in value chains. Specifically beneficial of the regional level is the close distance or co-location of supply and demand, which facilitates face-to-face interactions between buyers, suppliers and end-users. This is most evident in the phenomenon of 'living labs', which serve as localised playgrounds of user-driven innovation. Examples on the RIM website are for instance: Laboratory for new ideas and uses (Alsace, FR42) and PACA Labs (Provence-Alpes-Côte d'Azur, FR82).

According to a discussion paper of DG ENTR-Unit D2 (2009, p.9) *“many clusters shift from a ‘research-driven’ approach towards a more ‘user-driven’ approach, where the leading edge lies in the co-creation of values with the customers and in new forms of business cooperation”*. This may be true for some cluster policies but not for all. Especially in the cluster policies in Denmark the user-driven aspect is often emphasised. Other examples of 'living labs' can be found for instance in Finland, The Netherlands, Sweden, France, UK, Spain, and Austria; and the number of new initiatives of this type are increasing considerably. The innovation aspect does often not relate to R&D and technological inventions, but more to new applications, e.g., innovation in services, design, organisational innovations, eco-innovations, societal innovation, and innovation in the public sector, e.g. in health care.

Box 3-9 Amsterdam Living Lab (North Holland, NL32)

The Amsterdam Living Lab is an innovation playground where consumers, knowledge institutions and companies work in close cooperation to develop new products and services. The mix of inhabitants, infrastructure, and knowledge institutions creates an opportunity to use the city as a testing ground for innovation. One of the projects of Amsterdam Living Lab is Amsterdam Smart City. This collaboration between the inhabitants of Amsterdam, its businesses, research institutions and government authorities aims at showing how it is possible to save energy now and in the future: *“Together we are developing smart projects that will change the world. We test them in Amsterdam first”*. The project is a joint initiative of Liander (the operator of Amsterdam's electricity grid) and the innovation agency Amsterdam Innovation Motor. An extensive number of partners have signed up to participate in a wide range of projects. The independent (that is: public funded) research organisation TNO has joined Amsterdam Smart City and will conduct the research for all the projects. Another project is Apollon in which living labs in the Netherlands, Belgium, Spain and Finland have joined forces focusing on e-Health and energy efficiency. The project 'Care for tomorrow' revolves around user-oriented care solutions.

Link: <http://www.amsterdamlivinglab.nl/page/106/en>

A good example in this category of demand-side innovation policies is the Amsterdam Living Lab (Box 3-9). The localised nature is evidenced by the fact that it was initiated by the local innovation agency of the City of Amsterdam and not by the regional government of the Dutch Province of Noord-holland.

One of the advantages of demand-side policies at the regional level is the opportunity to involve end-users, e.g. in hospitals as in the case of the Living Lab Salud Andalusia (Box 3-10).

#### Box 3-10 Living Lab Salud Andalusia (Andalusia, ES61)

Living Lab Salud Andalusia (LLSA) is an open innovation network comprising the administration, universities, ICT corporations and end-users (citizens, patients and healthcare professionals). It consists of environments, platforms and resources for developing innovative technologies, services and initiatives in the health sphere, with particular emphasis on the involvement of end-users as the real driving force behind innovation. LLSA started in 2008 with a framework agreement in which a pioneer group of 44 public and private organisations from the healthcare and technology sphere took part. The network is based on an open innovation system aimed at facilitating the development and validation of different technological solutions for specific welfare problems.

Link: [http://www.livinglabsalud.es/llsa\\_en/index/](http://www.livinglabsalud.es/llsa_en/index/)

The Swedish project ‘Smart City Innovation Playground’ (Box 3-11) concerns a research and competence centre, which is transforming towards a demand-oriented innovation system with the support of a cluster organisation by applying the approach of open innovation and user-driven innovation.

#### Box 3-11 Smart City Innovation Playground (Norra Mellansverige, SE31)

This is a project, which aims to develop an Open Innovation Playground, with the ambition to become Europe’s leading research and competence centre for the development and application of geographic information technology and methods by 2014. The purpose is to use the competences, the environment and the tools developed by the cluster organisation Future Position X (FPX), and to exploit the potential of the rapid market growth of the GIS/GIT (geographic information systems/technologies) sector. There is also an ambition to contribute to regional structural change. E.g. by organising events for matchmaking between SMEs in the GIT-sector and clients in the services or technology sector; and by developing new platforms and demonstration facilities to promote entrepreneurship and service innovations. The project is run by FPX and has a total budget of €3.2m. Half of the funding is provided by the ERDF; the rest is provided by regional actors (Gävle municipality, the County Council of Gävleborg and the university college of Gävle) and by national actors (the Swedish Mapping, Cadastral and Land Registration Authority and the Swedish Radio Administration).

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=15311&r=SE31>

In Denmark regions have a ‘Growth Forum’ which functions as a platform for regional development. It brings together municipalities, companies, organisations and research institutions in a strong partnership with the goal of identifying and improving the framework conditions for innovation and business development in the region. Most of the projects are user-driven cluster policies (Box 3-12; and Box 3-13).

#### Box 3-12 Energy Cluster Zealand (Zealand region, DK02)

The challenge set for municipalities is an overall CO<sub>2</sub> reduction of at least 20% by 2020. This challenge can be used to create a commercial opportunity, providing a power lift and up-take of technological and organizational innovations. The project "Energy Cluster Centre Zealand" focuses on knowledge sharing and exchange of experiences in the area of energy, across municipalities and industries in the region. It aims to create innovative business opportunities and provide a ‘climate competence’ boost. The energy cluster aims for synergies for all parties: the municipalities will get higher competences and reach their energy and climate targets; businesses will have a new and longer-term business foundation; research institutions will get a platform for testing of prototypes, and opportunities for co-financing of their research.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=13323&r=DK02>

One of the advantages of the regional level (compared to the European and national level) of policy-making regarding cluster and lead-market initiatives is that it is more easy to select a limited number of sectoral, technological or thematic priorities and to select well articulated lead-markets, which match territorial specific advantages.

Box 3-13 Future Food Innovation (Central Jutland, DK04)

Central Jutland is one of the leading Danish clusters on foods. A third of Danish Food production is located in the region, and there is a number of leading research organisations. The aim of the project is to establish an innovation environment where research, business and users are brought together in order to drive the cluster forward. This will be pursued through a number of projects and new ways of collaboration in order to develop new technology, new packing and taste solutions, sustainable production, etc.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=13325&r=DK04>

A good example of a lead-market-type of regional initiative, which combines different demand-side innovation policies, is the InMotion programme (Box 3-14), which also includes the support of internationalisation and ‘market influencing actions’, innovation procurement and collaboration platforms.

Box 3-14 InMotion (Västra Götaland, SE23)

InMotion is the regional programme, which has an objective to make Västra Götaland one of the leading regions in environment, energy and sustainable transport solutions. InMotion is focused on promoting sustainable transformation and development for transport solutions and energy systems. It focuses also on the development of electrification and decreasing the dependence on fossil fuel sources. Funding is provided to projects and initiatives within the following six areas: environments for knowledge development, testing and demonstration; development projects (products, services, processes); internationalisation; market influencing actions; development and implementation methods for innovation procurement; SME funding; and strengthening of collaboration platforms at the Lindholmen Science Park in Gothenburg, and Innovatum in Trollhättan.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=12753>

#### 3.4.4 Stimulation of private demand

This type of demand-side policies promotes the diffusion and up-take of existing innovations. One of the most common types of direct support of private demand for innovations is the possibility in many ‘supply-side’ (R&D) programmes to use a part of the subsidy or grant for purchasing of innovations, e.g. machinery. Especially in many Central and East European Countries this kind of direct subsidy of demand for innovations from companies is often included in their basic and generic (non-sector specific) instruments to promote research and innovation in firms. Modernisation and increasing productivity is often the overall objective. In some cases programmes specifically focus on purchasing of new production equipment, for example the ‘Technology financing programme’ in Baden-württemberg (Box 3-15). A similar example in the RIM database is the project ‘Support for technology investments in SMEs’ (Marche, ITE3). Since these generic policy instruments do not target private purchasing of a specific kind of innovation or technology, the element of articulation of (regional- or sector-specific) demand is not included. Also the demand-side element of interaction between users and suppliers, in this case of innovative machinery, is not specifically addressed. In the specific case of Baden-württemberg (Box 3-15) the suppliers of machinery located in the region might benefit from this scheme (although it is not an explicit objective), but in many regional programmes of this generic nature the suppliers of the innovations might not be located in the concerning region.

### Box 3-15 Technology financing (Baden-württemberg, DE1)

Companies can use this scheme to finance new plants and machinery. The technology loans can also be used for costs of adaptation or development of new markets. The programme has been developed for small and medium-sized enterprises (SMEs) with a maximum of 300 employees. Fundable costs are: costs for plants, machinery and equipment; cost of operation-specific adaptation developments; costs for a project manager in the initial phase; expenses for market development; as well as introduction of new products; and cost of external market analysis, demonstration projects and pilot manufacturing series. Basically, the technology support programme is not aimed at promoting research and development in companies. The focus is on purchase of production equipment, machinery and equipment.

Link: <http://www.l-bank.de/lbank/inhalt/nav/unternehmen/vorhabenbestehenderunternehmen/technologiefoerderprogramm.xml?ceid=100221>

Another quite common type of measure involves those which promote the demand for, and use of, specific types of innovations or technologies; E.g., promoting the use of ICT in firms, but also in public sectors. Examples of such policies in the RIM database include: The Operational Programme Informatisation of Society (Slovenska Republika, SK0); Adoption of IT systems for business innovation (Provincia Autonoma Trento, ITD2); Support to ICT diffusion in SMEs (Umbria, ITE2), and the Information Society project in the Bratislava region (Box 3-16).

### Box 3-16 Information society in the Bratislava Region (Bratislavsky kraj, SK01)

The Bratislava region has been lagging behind in introduction of information and communication technologies (ICT). Citizens and small and medium enterprises (SMEs) would benefit from faster introduction of ICT in the region. E-government makes contacts between regional and local authorities, and citizens easier. The SMEs may increase their competitiveness with efficient ICT systems and services. Framework activities supported via the measure include: (a) developing e-government and e-services at the local and regional levels; (b) supporting accessibility of broadband internet services and (c) introducing and using ICT in SMEs.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=15188&r=SK01>

Ten years ago these initiatives could perhaps be labelled as 'lead-market-initiatives', but today it rather seems related to market situations of 'lagging-behind' and 'catching-up', which could be regional-specific. From a regional perspective it is important to note that not only the ICT users but also the ICT service industry in the region benefits from such policies.

Even more programmes in the RIM database are focused at stimulating the private demand and use of 'green' technologies and eco-innovations. Some examples from the RIM database include: Support to eco-innovative investments in SMEs (Marche, ITE3); Baross Gábor Programme (Del-Dunantul, HU23); financial support for eco-innovation in Picardy (FR22) and Support for the development and demonstration of innovative environmental technologies (North West, UKD). A priority of the SUNFLOWER project in the Bulgarian province Sliven (Box 3-17) is 'market stimulation' regarding renewable energy sources.

### Box 3-17 Working Towards Sustainable Energy Communities throughout Europe (SUNFLOWER), (Sliven Province, BG342)

The objective of SUNFLOWER (See also: <http://www.sunflowerproject.eu>) in the framework of Intelligent Energy Europe, is to create conditions that attract investment in renewable energy sources: projects that have potential, but are not attractive to the industry. It has also been implemented in Moura (PT), NorthYork (UK), Kilis (Greece), and various Czech regions. The project has been structured around three priorities: political commitment, market stimulation and environmental awareness. The aims are: to generate interest towards energy plants powered by renewable energy; to attract investors to the region and raise the number of partnerships between the renewable energy industry and local authorities; to promote entrepreneurship by training graduates and young businessmen interested in the field; and to raise the awareness of local communities.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=15316>



An increasing amount of regional innovation policy instruments provide support to export of innovations and to internationalisation of innovative firms (See for instance Box 3-18). One could question to what extent this type of activities falls under demand-side innovation policies, but why should the support to the up-take and diffusion of innovations be limited to the borders of the regional administrations. Moreover, reaching out to international demand seems an essential element in benefitting from the development of regional lead markets. One could also see it as promoting the demand, up-take and use in the region of market-innovations. Other examples in the RIM policy measure database include: Execution of marketing programmes directed to regional productive sectors and areas (Sardegna, ITG2) and Environmental Technology for Growth (Stockholm, SE11), but there are many more regional schemes that have extended the support to later phases in the innovation process or value chain, and thus have become less research-oriented.

Box 3-18 Export and Internationalisation Offensive in the Fields of Eco-Energy and Eco-Technology (Oberösterreich, AT31)

This project supports enterprises and individuals that are partners of the Upper Austrian eco-energy cluster or the Upper Austrian networks for environmental technologies and energy efficiency. The supported projects must have a strong focus on export. Support is provided in the form of grants for: patent applications and certification; the adaptation of products; specific market research and visits to specific events on the relevant new markets; training of employees with regard to the new markets; visits to trade fairs; consultancy; and marketing. Projects are supported with up to 40% and a maximum of €50,000 per project and eligible firm. Before a proposal is submitted, potential applicants can ask for advice at the Upper Austrian Energy Saving Association. To develop the required export strategy, potential applicants can make use of the export consultancy services offered by the Export Centre Upper Austria.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=13589&r=AT31>

Another type of (non-technological innovation) policy support that tries to stimulate private demand for innovations is the support for firms regarding design. Several examples can be found in the UK, for instance the Designing Demand programme in London (Box 3-19).

Box 3-19 Designing Demand Programme (London, UKI)

'Designing Demand' is a design support programme for businesses. It aims to help them become more competitive, increase their profits and boost their performance through the strategic, effective use of design. This measure has been developed by the Design Council and is being delivered in partnership with the English Regional Development Agencies and others.

Link: <http://www.rim-europa.eu/index.cfm?q=p.support&n=13390&r=UKI>

### 3.5 Interpretation of the analysis of demand-side innovation policy at regional level

This section has shown that a variety of demand-side innovation policies are in place at the regional level. The interest and investments of regional policy makers in this type of policies is increasing. An important reason for the increase is in the effectiveness of demand-side policies for addressing societal challenges.

At regional level the emphasis of demand-side innovation policy is on promoting the application of existing technological inventions in the public and private sector. Regional programmes, which promote public procurement of R&D or innovations, are not widespread yet, but many regions participate in the increasing number of national programmes.

It has become apparent that it is difficult to make a very sharp, black and white distinction between demand-side and supply-side innovation policies. Most schemes have to some extent an element of both. Moreover, at regional level innovation policy programmes or strategies often consist of a mix of policy instruments. Specific demand-side elements, such as public procurement are for instance often added to, and incorporated in existing policies.

As Iszak and Edler (2011) concluded for the national policy level, also at the regional level the lack of policy evaluations makes it difficult to identify cases of ‘good practice’, and to assess which tools work better than others.

Also regarding the four types of demand-side innovation policies at regional level the variety of measures is large and there is an overlap, which makes it hard to apply a strict separate assessment and classification. However, reviewing the current practices as reported in the Regional Innovation Monitor, allows for a preliminary categorisation and assessment along several policy features (Table 3-4).

Table 3-4 Preliminary characterisation of regional demand-side policy features\*

| Policy features                            | Promoting public procurement of R&D, PCP | Promoting public procurement of innovative goods and services | Systemic policies | Stimulating private demand |
|--|--|---|-------------------|----------------------------|
| Articulation of needs                      | High                                     | High  | High              | Low                        |
| Interaction with (end) users               | Medium                                   | Medium  | High              | Low                        |
| Support /benefit for regional users        | Low                                      | Medium  | Medium            | High                       |
| Support /benefit for regional suppliers    | Medium                                   | High  | Medium            | Low                        |
| Push: Diffuse existing innovations         | Low                                      | Medium  | Medium            | High                       |
| Pull: call for new inventions/ R&D results | High                                     | Low   | Medium            | Low                        |

\* Since demand-side policies are hardly evaluated, this characterisation is to a large extent based on hypotheses, which should be tested in evaluations.

Two important elements of demand-side innovation policies are: better articulation of needs and interaction with intermediate and end-users.

Improved articulation of needs and demand in interaction with users is hardly the case in policies that directly stimulate the diffusion and use of for instance ‘green’ innovations. In terms of diffusion, and up-take (and catching-up) the impact seems to be higher, but in the current practices these measures are often not designed to involve regional suppliers, and also regarding the demand there is often no regional specificity. Without bringing in a regional specific perspective, (e.g. by promoting interaction in the region between users and suppliers) the use of these policy measures for more targeted regional specific innovation strategies are limited. E.g. concerning very generic subsidies for the use of any kind of ‘green technology’ one could argue that the national policy level might be more appropriate.

Especially with public procurement policies the need is articulated more precise, but once formal procurement procedures have started, the possibilities for interaction with the competing potential suppliers (of R&D services and/or innovations) is limited. We have seen that in some cases on Pre-commercial Procurement bringing in the systemic tool of innovation platforms before starting the procurement procedures can solve this limited possibility for interaction between user and suppliers.

Characteristic for systemic policies at regional level is learning by interaction and the ability to involve end-users. Living-labs are good examples on how to extent user-driven innovation to end-users, especially concerning societal challenges.

There are differences between the national and regional level concerning the up-take of the different types of demand-side innovation policies. The largest difference is in the use of regulation and standardisation policies, which can be seen as major tools of new industrial policy, but mostly at the national and European level and not at the regional level. Also the cases where public procurement is explicitly addressed in dedicated regional programmes (supporting multiple cases of public procurement following a similar tendering procedure like PCP) are still rare.

Current successful demand-side innovation policies at regional level mainly include the two remaining types of demand-side policies: systemic policies and stimulating private demand for innovations. Especially systemic policies which involve the public and, or private users of technologies and innovations, and which facilitate interactive learning between users and suppliers of innovation are most relevant at the regional, and even local level. In many cases this also includes regional and local authorities as partners, especially when the clusters, living labs, (technology-, sectoral- or thematic) platforms or lead-market-type of initiatives touch on societal or public sector issues. A specific advantage of the regional level for systemic demand-side policies is the good conditions for involving end-users. Moreover, at a lower level of governance it is more easy for policy makers to select well articulated 'lead-markets' or prioritise more targeted thematic or sectoral area's of innovation.

Also the policies stimulating private demand for innovations are very appropriate and successful at regional and local level, e.g. regarding the promotion of the use of environmental innovations or ICT applications. But also with this type of regional demand-side policies oriented at private demand, the public sector often becomes a partner in many of the generated projects and initiatives. Whereas systemic policies are very useful tools in Smart Specialisation Strategies and for developing 'lead markets', the more generic instruments of 'stimulating private demand' are very relevant for diffusing existing innovations. They are therefore more appropriate for 'catching-up' strategies, especially concerning the application of General Purpose Technologies (such as ICT or 'green' technologies') for which a region could be 'lagging behind'.

Currently, 'systemic policies' and 'stimulation of private demand for innovations' are more widespread at regional level. Moreover, they seem more successful at regional level in enhancing interaction with the regional/local government or public sector as a partner and user, than 'stand-alone' procurement policies at regional level do.

Concerning public procurement there is an under-used potential at regional level. Regions would especially benefit from promoting innovative demand from public procurers in their daily procurement activities. Promoting innovative procurement is relevant for all regions. Promoting the procurement of R&D with dedicated regional Pre-Commercial Procurement programmes may not be relevant for each and every region, e.g.: for regions with a low autonomy. For some countries it seems more appropriate when regions participate in national programmes to promote PCP.

## 4. Conclusions and future challenges

There is a general trend towards more demand-side innovation policy approaches at national and regional level. An important reason for the increase is in the effectiveness of demand-side policies for addressing societal challenges.

We can conclude that it is difficult to make a very sharp, black and white distinction between demand-side and supply-side innovation policies. Most schemes have to some extent an element of both.

Regulation and standardisation are not very common demand-side innovation policies at regional level. Most current regional policies that promote innovative demand are systemic policies and measures stimulating private demand for innovations.

At national level there is a strong, recent focus on innovative public procurement and pre-commercial procurement. Programmes, which promote public procurement of R&D or innovations, are less well represented at regional level, but many regions participate in the increasing number of national programmes.

There is still a large under-used potential at regional level regarding innovative procurement. Since a large part of public spending is done at the sub-national level, a large potential exists for every region to increase the regional demand for innovations by promoting the public procurement of innovative goods and services.

Increasing innovative procurement and pre-commercial procurement requires establishing strong incentives, administrative reform, training, exchange of experiences in national and European networks, and 'learning-by-doing'.

In order to learn from policy interventions, and improve and diffuse practices, it is necessary to have evaluations and impact assessments of the implemented demand-side innovation policies, which are currently lacking.

The costs of a single case of innovative public procurement following a certain tender procedure (e.g. Forward Commitment Procurement), can be reduced by implementing programmes in which a number of procurement cases are supported following the same tender procedure. More programmes are needed, but they do not necessarily have to be implemented at the regional level. For promoting public procurement of R&D, national programmes in which regions can participate, can sometimes be more appropriate.

Also at the regional level the variety of measures is large and there is an overlap which makes it hard to apply a strictly separate assessment and classification, but reviewing the current practices as reported in the Regional Innovation Monitor allowed for distinguishing four types of demand-side innovation policies at regional level: promoting public procurement of R&D; public procurement of innovative goods and services; systemic policies and policies that stimulate private demand for innovations.

Two important elements of demand-side innovation policies are: better articulation of needs and interaction with intermediate and end-users. Systemic policies at regional level, especially the increasingly popular 'Living-labs', are successful on both these elements.

Whereas systemic policies are very useful tools in Smart Specialisation Strategies and for developing 'lead markets', the more generic instruments of 'stimulating private demand' are very relevant for diffusing existing innovations. They are therefore more appropriate for 'catching-up' strategies, especially concerning the application of General Purpose Technologies (such as ICT or 'green technologies') for which a region could be 'lagging behind'.

Increasingly demand-side innovation policies at regional level consist of a combination or package of measures. Examples of such a demand-side policy mixes are evidenced in systemic policies where for instance 'Living-labs' enter into public procurement programmes. Other examples in the RIM-database are public procurement policies that are preceded or followed-up by demonstration projects or innovation platforms.

Regions would benefit to a large extent from more innovative demand from public procurers in their daily procurement activities. Promoting innovative procurement is relevant for all regions. Promoting the procurement of R&D with dedicated regional Pre-Commercial Procurement programmes may not be relevant for each and every region, e.g.: for regions with a low autonomy. For some countries it seems more appropriate when regions participate in national or EU-wide sector programmes to promote PCP.

In order to further strengthen the public sector demand for innovations, it might be enough for some regions when national programmes for public procurement try harder to include and support also regional and local administrations concerning public procurement of innovation. Alternatively, e.g. for the regions with high level of autonomy, it might be good to implement their own public procurement and pre-commercial procurement policy programme at the regional level. Currently the lack of expertise and experience concerning such policies are a major barrier to wider implementation at regional level.

Another option is to increase and integrate the aspect of innovative public procurement in the existing and more successful type of demand-side policies. This could strengthen the role of governments as partners and users in system policies and as partners in policies stimulating private demand. This would also call for a more strategic role of regional and local governments and a better articulation of the regional public needs. Cooperation with other regions, which share the same public (sector) challenge, should also be promoted. This more strategic role and better articulation of regional needs could facilitate the development and implementation of more targeted Smart Specialisation Strategies.

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## Appendix B Examples of demand-side innovation policy measures at national level for EU Member States

|  | <b>Programme features</b>  | <b>Insight gained/lessons learned</b>  |
|--|--|--|
| <b>Denmark</b><br>Programmes for User-Driven Innovation                        | Grants to promote and develop user-driven innovations; MindLab initiative; GreenLabs                       | To uncover user needs takes time and is not automatically followed by innovation. Involvement of top management and co-operation across different sectors and business areas are the main challenges.  |
| <b>Finland</b><br>Funding for procurement of innovation in the public sector   | Central or local government can apply for funding for the procurement of innovative products or services.  | The funding instrument of TEKES is seen as an effective tool to assist in finding innovation procurement solutions. Challenges include: raising interest in the funding instrument at local level; developing efficient market dialogue with the private sector. |
| <b>France</b><br>Facilitating access to public procurement for innovative SMEs | Preferential treatment for innovative SMEs, 15% of small technology contracts reserved for innovative SMEs | Meetings between Ministry of Economy and public purchaser help to identify challenges that procurers sometimes face. Safeguarding competition rules is a major challenge in giving preference to SMEs procurement.   |
| <b>Italy</b><br>Green Energy Innovation Funds                                  | New policies to meet needs of SMEs and social needs and to stimulate innovation, and job creation.         | Innovation policy goals can be realised by linking demand-led learning and the demand-side issues relating to SMEs and social needs, e.g. concerning climate change, renewable energy, and health care.  |
| <b>UK</b><br>Forward Commitment Procurement                                    | Model for public procurement of innovation   | The approach looks at purchasing from the outcome based specification need (not the immediate perceived need).   |
| <b>Spain</b><br>Public Procurement in Spain's Innovation Strategy              | Procurement of the world's largest single aperture optical telescope, as a way to promote innovation       | Government can use public procurement of large scientific facilities as a way to promote innovation by enhancing supplier capabilities and commercialisation of technologies through spin-off creation.  |
| <b>Portugal</b> (and also in Estonia, Germany, Netherlands, Lithuania)         | The Portuguese E-Mobility programme Mobi.E aims at fostering the diffusion of electric mobility            | Involved the creation of a consortium with firms from electrical machinery, electronics, electricity and software to design and build an infrastructure for charging batteries and for informing users about availability of charging posts.                     |
| <b>Germany</b><br>Five 'demand areas'  | High-tech Strategy 2020 adopts user perspective  | The five 'demand areas' are: climate change & energy, health & nutrition, mobility, security, and communication. Integrates demand-side elements in thematic R&D programmes  |
| <b>Austria</b><br>'Green energy law'   | Law to increase the share of renewable energy and support green energy innovations to reach marketability  | Different delivery methods, including: investment allowances for hydro power stations subsidised fixed line entry-tariffs of green energy. Target groups are energy producers in the field of wind energy, biomass, biogas, hydropower and solar energy.         |

Source: OECD (2011, p.14), TrendChart mini Country Reports and the INNO Policy TrendChart database.