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Trends and Challenges in Demand-Side Innovation Policies in Europe

Thematic Report 2011 under Specific Contract for the Integration of INNO Policy TrendChart with ERAWATCH (2011-2012)

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Authors: Kincsö Izsak & Jakob Edler[1]

[1] Jakob Edler is Professor of Innovation Policy and Strategy and Executive Director of the Manchester Institute of Innovation Research

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Introduction

The European TrendChart on innovation is the longest running policy benchmarking tool at European level. Since its launch in 1999 it has produced annual reports on national innovation policy and governance, created a comprehensive database of national innovation policy measures and organised a series of policy benchmarking workshops. The coverage was expanded towards research policy with the launch of the parallel ERAWATCH initiative in 2004.

The policy monitoring databases of INNO Policy TrendChart and ERAWATCH were merged in 2007, with the creation of a joint European Inventory of Research and Innovation Policy Measures by the European Commission with the aim of facilitating access to research and innovation policies information within Europe and beyond.

With a view to updating the innovation policy monitoring, the European Commission DG Enterprise and Industry commissioned the ERAWATCH Network ASBL to provide an enhanced overview of innovation and research policy measures in EU Member States as well as countries participating to the Competitiveness and Innovation framework Programme (CIP) and specific third countries. The contractors are also undertaking activities with a view to the full integration of the INNO Policy TrendChart and ERAWATCH services.

In order to complement the collection and update of research and innovation policy measures, a trend report on innovation policy, an overview report on innovation funding in the EU and an analytical thematic report will be elaborated once per year in 2011 and 2012. Demand-side innovation policies were selected as the theme for 2011.

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 authors alone.

The present report is based on the analysis of the INNO Policy TrendChart database and on the information provided in the TrendChart mini country reports, and it is not a result of a full-fledged survey of countries.

1. Objectives and scope

Demand-side innovation policies are important policy instruments aiming to increase the demand for innovations, to improve the conditions for the uptake of innovations or to improve the articulation of demand (Edler, 2007). Their potential is widely recognised and actively promoted. Famous success stories, where regulation, standards or public procurement played a critical role in spurring innovation, are for example the Internet, the GSM for mobile telephony, aircraft jet engines, high-speed rail technology, or recent eco-innovative developments.

The relevance of demand-side measures is highlighted by the European Commission's "Innovation Union" Communication (EC, 2010), which argues that "the potential of the single market should also be activated through policies that stimulate the demand for innovation", furthermore it says that a "bolder approach associating the supply and demand sides is needed".

In practice, supply-side measures seem still to be the prevailing innovation policy choice. A growing awareness amongst policy makers for the need to better exploit the power of public spending for innovation and the emerged focus on searching solutions to societal challenges might provide, however, a promising basis for the future spread of demand-side innovation policies.

The current report aims:

- to identify the trends in the deployment of demand-side innovation policy at national level in the EU Member States during the period mid-2009 to mid-2011;
- to give an overview on recently introduced demand-side innovation policy measures and to ascertain if there are any observable patterns;
- to provide insights into how demand-side measures are being implemented;
- to analyse governance practices for coordinating between demand-side and supply-side measures.

The trend analysis of demand-side innovation policies covers 31 European countries (EU 27 plus Norway, Iceland, Switzerland and Liechtenstein) and relies to a large extent on the information provided in the 'mini country reports' prepared by the TrendChart country correspondent network during the period of June/September 2011.

2. Short story of demand-side innovation policy

2.1 The meaning of demand for innovation

Demand-side innovation policy measures are a popular topic in innovation policy literature. The spread of demand-based policy approaches has developed from theories on the systemic nature of innovation, market-pull and user-producer interactions (Edler 2007, OECD 2011). However, discussions on the positive impacts of demand-side innovation policies took place as early as the 1970s, and the use of public procurement to support innovation was on the policy agenda already in the 1970s and 1980s (Mowery & Rosenberg 1979, Geroski 1982, Edler, 2010). Demand-side policies such as large, mission-oriented technology procurement policies have existed for many decades. However, those activities were often individual measures designed to achieve specific goals, and most often they were part of old style industrial policy to support specific industries. Only recently has demand-side policy been more prominent in *innovation* policy.

The *role of demand as an enabler and source of innovation* has been a constant topic in innovation economics. Since Marshall in the late 19th century, many authors have stressed that the supply of new technologies is triggered by demand and economic value only created through the interplay of supply and demand. [2] In the innovation literature this is often expressed by the Schumpeterian dichotomy of "technology push" and "demand pull" (Martin, 1994, Coombs et al 1987). Demand signals trigger innovation and, hence, "pull" innovation or new technologies into the market.

There are two different ways in which demand is linked to innovation: demand can be *responsive* to innovations and it can *trigger* innovations (Allmann et al 2011).

Firstly, responsive demand is determined by the willingness and ability to absorb innovations once they are produced. This demand is not the origin of the innovation, but obviously crucial as an incentive for producers of innovations. The literature has put great emphasis on the ability and willingness of demand to adopt to innovations and the speed of diffusion of innovation as an important positive characteristics of markets (e.g. Tellis et al 2003,Trott 2003, Veryzer 2003)[3].

A second way in which demand stimulates innovation is more direct, as private or public actors express a new need for an innovation and thus trigger the generation of innovation (von Hippel 1986, Prandelli et al. 2008). Innovation triggering demand necessitates costumers that are sophisticated and thus able to express their needs and, as appropriate, interact with producers. For producers, it is important to be close to the early signals of sophisticated costumers, to be able to interact and co-produce the knowledge and technologies needed to satisfy the needs or wants expressed by potential users. Triggering demand is most meaningful for producers if it is in sufficient spatial proximity to customers and in markets with critical mass, so that the initial production of innovation is linked to responsive demand and thus to its initial diffusion. The most direct form of triggering demand stems from the involvement of users in the innovation creation process. A special emphasis is placed on 'lead users', a term coined by von Hippel (1986) referring to individuals or organisations that experience and express needs for a given innovation earlier and are willing to take up and use innovations first. Often, lead users, well aware of their own desires and

[2] The literature on demand conditions for innovation is vast: just to mention a few, Schmookler (1962), Mowery/Rosenberg (1979), Rothwell (1983), Granstrand (1984), von Hippel (1986), Porter (1990), Edquist/Hommen/ Tsipouri (2000), McMeekin et al (2002), Gemünden and Beise (2004), Wilkinson et al. (2005), Bihde (2006), Georghiou (2006, 2009), Fontana/Guerzoni (2007), Anderson (2007), Edler (2007, 2009, 2010, 2011), Blind (2009), Zerka (2010) have contributed substantially to the debate.

[3] See Miles et al 2009 and Allman et al 2010 for analysis of triggering and responsive demand

objectives, interact closely with firms and are an important generator of ideas and source of innovation. The importance of early innovation adopters has been emphasised by authors such as Porter (1990), Gregersen & Johnson (1996), Rothwell (1992), von Hippel, (1998 & 1988) and Sölvell et al (1991). Prahalad (2008) points to personalised, co-created experiences as one pillar of the 'house of innovation' where competitive advantage depends on a firm's ability to engage in new business processes that provide a unique quality of experience for the customer.

A further important dimension of demand is standards and standardisation processes, as they shape expectations for buyers and facilitate the growth of markets. Standards intervene on the demand-side given that they are necessary to accompany the emergence of new markets and contribute to knowledge diffusion (EC, 2008a). A set of analyses has looked at the meaning of standards and standardisation processes for innovation (Tassey 2003, Blind and Jungmittag 2008, (Blind et al. 2010) or trade performance (Swann et al. 1996 or Blind and Jungmittag 2005). The relationship between research and standardisation was addressed by Blind (2009), who illustrated the relevance of standards for research activities. He argued that the integration of patents into standards broadens and fastens the diffusion of technological know-how and analysed the potential of standards for innovation oriented public procurement policies. Meeting standard requirements can be nevertheless also a constraint for businesses to innovate. The role of standards as a driver for, but also as a potential barrier to innovation, has been identified quite early by innovation policy.[4] To this end, a critical issue is timing, since a premature standardisation may limit product variety and lock industries into inferior standards (NESTA, 2007). It has to be also pointed out that an important trend that with globalisation international standards are gaining more ground.

Demand conditions have also been defined as key determinants of competitiveness of *locations*. For example, demand is one of the factors of the diamond model developed by Porter (1990). Demand conditions in the home market can help companies create a competitive advantage, when sophisticated buyers pressure firms to innovate faster which will result in more advanced products than those of competitors. It is in this context that the term 'lead market' was coined and popularised. Recently, a range of authors have examined the conditions under which markets become lead markets (Jacob et al 2005; Beise/Rennings 2005, Meyer-Krahmer 2004, Edler/Georghiou 2007), including: early and clear signals of (potential) buyers to demand innovative solutions, economic ability to pay higher entry costs of innovations, critical mass of demand, a certain level of problem pressure (or high political priority) in a market, pioneering regulations as well as conducive supply conditions such as good framework conditions for rapid learning and adaptation processes for suppliers, adequate technological and productive competence in the entire valued added chain and supporting service (Edler 2010). Markets showing those conditions are more likely to adopt innovations quickly and, similarly, more likely to host firms that produce them, for the home and subsequently the export markets.

Due to the recognition of the importance of demand conditions for the competitiveness (see most recently OECD 2011), there have been growing attempts to characterise demand conditions in different countries. Especially in the UK, demand conditions have been defined as essential elements of wider framework conditions for innovation (Miles et al 2009, Almann et al 2010). The 2007 INNO-Metrics thematic

[4] Blind, K. (2010)l, The Use of the Regulatory Framework for Innovation Policy, in: R. Smits, S. Kuhlmann, P. Shapira (eds.), The Theory and Practice of Innovation Policy: An International Research Handbook, Cheltenham: Edward Elgar, 217-246; Egyedi, T., K. Blind (2008), The Dynamics of Standards, Cheltenham: Edward Elgar; Blind, K. (2011), An Economic Analysis of Standards Competition - The Example of the ISO ODF and OOXML Standards, Telecommunications Policy 35, 373-381; Blind, K., S. Gauch (2009), Research and Standardisation in Nanotechnology: Evidence from Germany, Journal of Technology Transfer 34, 320-342.

paper on 'Differences in socio-economic conditions and regulatory environment'[5] found that within the demand category, the indicators for government procurement and demanding regulatory standards suggest an important role for government in raising innovation performance through these mechanisms. Further rationale was provided for demand-side policies by the Innobarometer 2009 (analysing innovation spending, the role of innovation in public procurement and the effects of public policies to boost innovation), which revealed that nearly half of the enterprises surveyed indicated that demand-side policies had positively impacted their innovation activities. This confirmed older studies on firm attitudes, indicating poor demand conditions as biggest obstacle for innovation (BDL 2003).

2.2 Demand-side innovation policy: definition and illustrations

The literature on innovation systems acknowledges the importance of demand, but failed to address the concrete role of public policy. Lundvall (1992) noted that the public sector plays an important role in the process of innovation being the single most important user of new products and services and its regulations and standards influence the rate and direction of innovations. As von Hippel (1976), Mowery and Rosenberg (1979) argued, a systemic innovation policy should organise the interactions between users, consumers and other innovation stakeholders in order to articulate and communicate preferences and demand to the market.

The role of governments and policy is broad when it comes to the demand and demand conditions for innovation. Several definitions and classifications exist for demand-side innovation policy. One definition, often used, defines demand-based innovation policy as "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 allow their diffusion (Edler, 2007)".[6] In general, demand-side innovation policies aim at addressing barriers affecting the market introduction of innovations (responsive demand) and at the ability to define and signal new functional needs to producers (triggering demand).

Edler and Georghiou (2007) proposed to classify demand-side policy instruments in four categories: public procurement, regulation, policies supporting private demand and systemic policies. Some policies consider other instruments as demand-side and some definitions also include cluster framework policies, foresight activities or research on societal challenges (rather than spurring demand in order to tackle those challenges); however, this is too wide a scope and diverts attention from the key tools influencing innovation demand.

Pre-commercial public procurement is a specific kind of public procurement that deserves further elaboration. Pre-commercial procurement can play an important role in creating markets for new innovative applications and it is often regarded as a demand-side policy tool. However, it has to be kept in mind that it "concerns the research and development (R&D) phase before commercialisation", (EC, 2008) and this is why it intervenes strongly in the supply side as well. The demand-side element arises through lowering transaction costs of new product adoption, by sending a powerful signal to the private sector and thus engendering a spill-over to private demand (Zerka, 2010).

[5] Relative importance of socio-economic and regulatory environment for explaining differences in innovation performance available at http://www.proinno-europe.eu/metrics

[6] The improvent of demand articulation also involves the inter-action between user and producers in the co-generation of innovation between users and producers.

For the purposes of this report, the following categorisation of demand-side policies is used:

Figure 1 Categorisation of demand-side policies

Demand-side innovation policy tool	Short description
Public procurement	
Public procurement of innovation	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.[7]
Pre-commercial public procurement	Pre-commercial procurement is an approach for procuring R&D services, which enables public procurers to share the risks and benefits of designing, prototyping and testing new products and services with the suppliers[8].
Regulation	
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.[9]
Standardisation	Standardisation is a voluntary cooperation among industry, consumers, public authorities and other interested parties for the development of technical specifications based on consensus and can be an important enabler of innovation.[10]
Supporting private demand	
Tax incentives	Tax incentives can increase the demand for novelties and innovation by offering reductions on specific purchases.
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. [11]
Awareness raising campaigns, labelling	Awareness raising actions supporting private demand have the role to bridge the information gap consumers of innovation have about the security and the quality of a novelty.[12]
Systemic policies	
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 wide range of different services13.
Support to user-centred innovation	User-centred innovation refers to innovation driven by end- or intermediate users.[14]

It is widely recognised that the innovation policy mix should be composed of both supply-side measures as well as demand-side instruments (Edquist, 2000; Soete and Corpakis, 2003; Smits and Kuhlman, 2004; Edler and Georghiou, 2007). Smits and Kuhlmann (2004) identified a set of five systemic functions that play a crucial role in the management of innovation processes: one of them is 'stimulating demand

7 NESTA (2007) Demanding Innovation Lead Markets, public procurement and innovation by Luke Georghiou
8 http://ec.europa.eu/information_society/tl/research/priv_invest/pcp/index_en.htm
9 FORA, OECD: New nature of innovation, 2009, http://www.newnatureofinnovation.org/
10 Commmission Communication: Towards an increased contribution from standardisation to innovation in Europe COM(2008) 133 final 11.3.2008
11 Edler, Georghiou (2007) Public procurement and innovation – Resurrecting the demand side. Research Policy 36. 949-963
12 Edler (2007) Demand-based Innovation Policy. Manchester Business School Working Paper, Number 529.
13 COM 2005 "Industry Policy" http://ec.europa.eu/enterprise/enterprise_policy/industry/index_en.htm and Mid-term review of industrial policy
14 Von Hippel (2005) Democratizing innovation. The MIT Press, Cambridge

articulation, strategy and vision development'. However, they concluded that innovation support portfolios were still heavily dominated by financial instruments.

More recently, Edler (2011) argued that a policy mix focusing on demand factors for innovation can induce modernisation of the economy and of public services and can accelerate the catching up process of less-developed states and regions. It has also been shown that demand-side factors have a significant influence on economic development and greater support for *industry-level demand* could be an effective tool for improving innovation and growth (Bogliacino and Pianta, 2009).

A recent report (OECD 2011) outlines examples of current attempts in OECD states to implement demand-based innovation policy measures and, in some cases, more systematic attempts. It shows the growing interest in demand-based innovation policy, but acknowledges the challenges for design, implementation and evaluation.

The instrument most widely discussed in the past decade is *public procurement* of innovation. However, public procurement has been an instrument of public policy for many decades. In fact, many breakthrough technologies would not have been developed without governments specifying a functional need and readiness to invest in solutions. After the Second World War, it was in the area of defence where innovation procurement was most prominent dual use (Molas-Gallart 1997, James 2004), shifting to demand tools for industrial policy and large scale infrastructure investments. Technology procurement was an established means of industrial policy. This is best researched for Nordic countries (Palmberg (1997) and Edquist et al (2000). Granstrand suggested a general framework for the patterns of buyer-seller interaction with special reference to the importance of procurement in the specific areas of telecommunications and power transmission (Granstrand, 1984). In Finland, the government played an important role as a lead user when commissioning new products and services (Ebersberger, 2007).

From the beginning of the 2000s, there has been a renewed interest in public procurement of innovation, inspired by work commissioned by the European Commission (Wilkinson et al, 2005, Edler et al 2005) and reflected in a range of specific cases of public procurement of innovation (Rolfstam 2005, Myoken 2010, Uyarra 2010, Aschhoff/Sofka 2009, Lember et al. 2011, Georghiou et al 2010). Most of these early examples, however, were not elements of a broader innovation policy strategy, but one-off incidents analysed to define the success and hindering factors within procurement when it comes to innovation.

The rationale for this resurgence of interest in public innovation procurement was twofold, firstly, to contribute to tackling societal (or "Grand") challenges in Europe; and, secondly, to do so by improving the potential for innovation by demanding leading edge solutions from the market (Kok et al. 2004, Aho et al 2006). Subsequently the EU Lead Market Initiative was designed and implemented as the first comprehensive (if limited in its budget) attempt to link a set of demand-based measures around selected technologies and issue areas (EC 2007, see below). In parallel, individual Member States have started their own initiatives to make their procurement more innovation friendly (see below) and a network of policy makers and analysts has worked on public procurement of innovation in small EU Member States (OMC-Net ERA-PRISM[15]), indicating the expectations that it is not only the size of the market, but the ability to mobilise innovation for niche applications in small countries can make a difference. Further, the understanding of innovation procurement has broadened, to involve also pre-commercial procurement measures which support in a multi stage process the development of new solutions (through R&D services), for which public agencies have defined a need and signalled potential uptake. This, however, is at the interface of supply and demand, as the support is for the

[15] See www.eraprism.eu/

development of the solution and the demand is in-built, but uptake and actual purchase in most measures not guaranteed to the producer (ERA-PRISM, 2010).

In terms of analysing the deployment of demand-side measures in EU Member States, the last revision of INNO Policy TrendChart[16] included a thematic policy brief on the subject. According to the report (2009), Finland, Germany, France, Ireland, the Netherlands, Norway, Spain, Sweden and the UK were among the pioneering countries; demand-side policies were actively debated in Austria and Belgium; while Bulgaria, Czech Republic, Latvia, Lithuania, Malta and Poland started to consider demand-side measures and no or very little debate has taken place in Estonia, Greece, Hungary, Ireland, Italy and Slovakia. Another study published by Edler (2011) on the state of play of demand-side innovation policies in Central Eastern European countries 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". However, the latest OECD report on demand-side innovation policies presents a range of new attempts across the OECD, most of which are still in the design and early implementation phase.

2.3 European perspectives

As mentioned above, an important stimulus for demand-side innovation policies across Europe has come from the European Union level. The first breakthrough putting demand-side innovation policy in the spotlight was the Aho report 'Creating an Innovative Europe'. Although, previously, the Kok-report (2004) in its review of progress on the Lisbon strategy recognised the role of procurement in providing pioneer markets for innovative products. One of the key recommendations of the Aho report was to provide an innovation-friendly market for businesses, through actions on regulation, standards, public procurement, intellectual property and fostering a culture, which celebrates innovation. Following this report, the European Lead Market Initiative was launched in December 2007 focusing on six thematic areas (markets). For the first time a systemic, albeit limited, bundle of demand-based innovation policy measures was designed and implemented, mobilising public procurement networks, standardisation, regulation and accompanying measures.

The momentum built by the Aho Report and the Lead Market Initiative is maintained with, most recently, demand-side innovation policy prominent featured in the 'Innovation Union' Communication (EC, 2010). The Communication calls on Member States and regions to "set aside dedicated budgets for pre-commercial procurements and public procurements of innovative products and services that should create procurement markets across the EU starting from at least €10b a year for innovations". The Communication also proposed the creation of so called 'European Innovation Partnerships' that are expected to fast-track necessary regulation and standards, and to mobilise 'demand' in particular through better coordinated public procurement to ensure that new ideas are quickly brought to market. In addition, the Council[17] invited the Commission to assess how to meet best the needs of fast-growing innovative companies through a market-based approach, and to explore the feasibility of a Small Business Innovation Research (SBIR) measure. These developments provide an opportunity to foster a stronger deployment of demand-side innovation measures.

Regarding policy intelligence about demand-side measures, the Commission took several initiatives. It published a Handbook on Public Procurement for Innovation in 2007 (EC, 2007c) and a Green Procurement Guide[18] in 2004. Moreover, public procurement has been dealt with in several INNO Policy TrendChart and INNO Grips studies. A specific analysis explored "pre-commercial public procurement of R&D"

16 http://www.proinno-europe.eu/trendchart/thematic-briefings
17 http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/119175.pdf
18 http://ec.europa.eu/environment/gpp/pdf/buying_green_handbook_en.pdf

(EC, 2008a). Further, the EU commissioned the first systematic conceptualisation of an evaluation of demand-based innovation policy (Blind et al 2009) and commissioned a study to develop an applicable evaluation method (see next section).

European interventions in demand-side innovation policies can be regarded as critical for several reasons. They provide a laboratory from which national policy makers can learn. Second, they can bundle activists from different countries to move forward and implement joint actions with a critical mass of demand. Even more important, it is the European level where key regulations are defined, and hence, the application of innovation friendly regulations and procurement rules and practices are key.

2.4 Evaluating the impact of demand-side innovation policy measures

Since demand-based *innovation* policy have been scarce over the last two decades, so have been systematic evaluation or impact assessments.[19] The numerous attempts to set up explicit demand-based policy measures in the area of innovation policy, that are documented in this report as well as in the recent OECD policy report (2011) are not yet backed up by evaluation activity.

There have been several *older, more general studies* providing evidence about the positive impact of demand-side innovation policies. Rothwell and Zegveld (1981) showed that public procurement triggered greater innovation impulses than R&D subsidies and emphasised that public technology procurement is an instrument for helping regions to become more innovative (Rothwell, 1983)[20] Early attempts at evaluation focused on demand-side diffusion policies, i.e. those policies that supported the buyer and adopter of new technologies (and services), largely firms. Many of these assessments focused on efficiency of the measures rather than outcomes in terms of influencing and strengthening demand (Stoneman & Diederen 1997), while others (Wengel et al. 1985) also looked at the induced changes in adopting firms and the overall diffusion effects.

The most elaborated evaluation designs have been applied on diffusion programmes in the area of energy diffusion programmes.[21] Those programmes are often composed of a mix of measures that try to lower the diffusion threshold of more energy efficient technologies, tackling both public and private demand.[22] An early example of the evaluation of such measures in Europe, with a strong focus on public procurement and its catalytical effect, are the evaluations of the market transformation programmes, most prominently the Swedish Market Transformation Programmes (Neji 1998; Suvilehto/ Överholm 1998, Nutek 1984) and demand-side management programmes organised via the International Energy Agency (Westling 1996). Those programmes tried to change the demand (and *subsequently* supply) in the markets for energy consuming products towards innovative, energy efficient products. The evaluations found a change in purchaser behaviour (firms, retailers, consumers) through surveys and market analysis; a strong development of the specific market (measured by market shares and prices, development of standards, changes in related infrastructure); and finally, impact on development of *new* technology as a consequence of more dynamic, innovation prone markets (Neji 1998,p. 2, Suvieltho / Överholm 1998). All of those evaluations used a combination of qualitative and quantitative measures and all applied time series analyses. The various evaluations overall claimed considerable success for the transformation programmes in terms of accelerating the diffusion of innovations. However, at the same time they highlighted the time lag between measures and effects, concluding that each evaluation of demand

[19] This section draws on Edler et al (2012).

[20] Similar findings can be found in Dalpé 1994 and Dalpé et al. 1992.

[21] This and the following sections are based on Edler et al 2011.

[22] Evaluations of energy efficiency programmes employing demand side instruments can be found at http://iepec.org

based measures faces time lag problems and thus runs the risk of under-estimating the overall effect of the measure.

Partly based on a concept development study (Blind et al 2009), a first evaluation of the European Lead Market Initiative was performed (CSES/Oxford Research 2011). The evaluation praised the integration of diverse demand-based instruments to push for innovation in selected markets. It found very different levels of mobilisation between the six markets, with most progress made in the area of sustainable consumption. It assessed interaction of different policy levels as difficult, but acknowledged a good level of interaction with industry. Overall, the instrument in its design and basic approach is assessed as a promising policy innovation, however, falling short of the expectations raised by the Aho report and the demand-based strategy of the Commission.

There are as yet no systematic *evaluations* of public procurement of innovation. Edler and Georghiou (2007) analysed the rationales, potential and necessary framework conditions for the use of public procurement, identifying critical factors, such as the importance of governance, bringing public needs and supplier capacities in line and activating and enabling the procurement chain. They stressed that strategic public procurement is about selecting whole market areas in terms of their importance to the economy.

A study on public procurers in Germany found that innovation considerations are of very low importance (Wegweiser et al. 2009). The *case studies* on public procurement focus on innovation and the success factors for innovation to happen, but less on the actual effect of those procurement activities on markets and on public services (Edquist et al 2000, Edler et al 2005, Lember et al. 2011, Georghiou et al 2010). The studies show the importance (and often lack) of proper incentives and risk-reward relations for the actors involved, arguing that procurers do not have the incentive to risk failure and increase transaction costs by demanding innovative solutions, while those using the innovation internally often are not engaged in the procurement process. They further show the importance of capabilities in the whole decision-making and implementation chain in public procurement, with procurers often not aware of the innovation pipeline in the market and the internal decision makers and users not aware of the challenges of the procurement process. The studies further show the importance of a flexible and intelligent use of legal instruments in order not to stifle interaction between producers and potential buyers. Further, these analyses pointed towards the fact that innovation environments are very different between countries and highlighted the observation that public agencies and producers in 'immature environments' are much less able and likely to conduct innovation procurement. Study on the policy leverage for energy technology innovations (Jochem et al 2010, Jordan 2011) showed the need for a comprehensive analytical underpinning of demand-based policies. This ranges from an analysis of the technological innovation system, to capabilities and interests of demand and supply actors, to the study of technological pipelines and the business infrastructures needed for innovations to be successfully rolled out into the market. In fact, the latter, more systemic considerations criticise the limited policy approaches that focus entirely on the demand-side and demand conditions without taking into consideration current and future supply conditions more broadly.

Summing up, the few available evaluations of demand-oriented diffusion policies and innovative public procurement put a spotlight on the need for demand-oriented policy measures to be designed with market and supply-side conditions in mind for such policies to have a significant impact after a fairly long time span on innovative market areas. Given that innovation policies are functionally and in time rather tightly intertwined with other policies, the experience suggests that an integration or at least close co-ordination with related policies appears indispensible.

3. Trends in demand-side innovation policies

3.1 Overview

Demand-side innovation policy continues to gain further attention in EU Member States and is in strategic terms a relatively 'hot topic' on innovation policy agendas. Innovation policy is increasingly more broad-based and seeks to couple different kind of policy instruments to address a specific challenge, theme or sector with increasing emphasis on a user-driven approach.

Although there appears to be a general trend of growing awareness about the importance and potential positive impacts of demand-side policy tools in the EU and there is some awareness of these instruments in all countries covered by this report, the level of policy debate and of concrete actions in the field is very diverse. While some of the countries are moving towards an integrated strategy of demand-side policies as part of innovation policy, others only experiment with demand-side type instruments. Finally, there are some countries, which are hesitant to launch demand-side policy measures.

While the present report focuses primarily on demand-side policy measure trends that originate from innovation policy, there is a significant share of support measures launched in the framework of other policies, such as competition or sectoral policies, (even labelled as targeting innovative activities sometimes) which have important implications for business innovation performance. The present analysis relies on the database of INNO Policy TrendChart that covers research and innovation policy measures and, hence, the overview of demand-side innovation policy trends reflects the trends in innovation policies. However, the report also gives illustrative examples from other policy domains, which target demand-side innovation.

The TrendChart country reports indicate a pattern of three main country groups:

- (1) a *strong policy discourse and experience*: countries which have built demand-side policies into their innovation policy mix, have concrete experience with such measures and, in certain cases, are moving to a strategic integrated approach;
- (2) a *relevant policy discourse and experimentation*: countries where the topic appears important in policy debates and new actions are launched or planned;
- (3) a *limited policy discourse and/or action*: a large group of countries capturing both countries where there is limited awareness of the topic and in some cases no action; or those where a formal policy is not articulated although some initiatives exist.

1st Group: Strong policy discourse and experience

Demand-side innovation policies remain highly relevant in those countries that pioneered such instruments. The countries in this group include those moving towards a strategic integrated approach of demand-supply side policy mix such as Germany, Finland, Denmark, Belgium (Flanders) or Sweden and others working on further developing existing measures such as the UK, the Netherlands and Norway.

Germany's High-tech Strategy 2020 adopts a new user perspective by defining five 'demand areas' of technology development (such as climate change and energy, health and nutrition, mobility, security, and communication) that are addressed both by supply and demand-side measures. The approach integrates demand-side policy elements into the thematic R&D programmes. The Government's innovation strategy also targets specific areas such as energy innovation and e-mobility. Despite this integrated view tax exemptions and direct subsidies are currently a controversial topic of discussion.

In 2010, Finland elaborated a specific framework and action plan for demand and user-driven innovation policy. The current innovation policy strives to combine

different kind of instruments both supply and demand side in order to reach an optimal policy-mix for each specific sector or development area.

Demand-side innovation policy is integrated in programmes targeting public-private interactions in Denmark. Many of the new measures require public-private partnership suggesting that a systemic policy approach has been strengthened. There are also strong promotion and concrete actions in the area of support to user-centred innovation and smart regulation.

Belgium has to be regarded from the point of view of its federal system. While demand-side innovation policy constitutes an integral part of the Flemish innovation policy with an important track record in innovative public procurement measure, Wallonia and the Brussels-Capital Region do not have explicit demand-side policies.

The new 'top sector' initiative of the Netherlands introduces a sectoral approach into innovation policies and the intention is to pull in more demand-driven input from businesses into government policy. Although demand-side innovation policy is not labelled as such, demand-side instruments such as innovative public procurement and pre-commercial procurement are significant. A shift is also planned away from grants towards the use of tax reductions, credit measures and regulatory reforms.

In the UK, interestingly, while pioneering in areas like public procurement of innovation, the move towards systematic roll out of demand-based principles and practice has somewhat slowed down.

2nd Group: relevant policy discourse and experimentation

There are several countries with a more recent track record in the field that are currently experimenting with new measures while highly debating the development of demand-side innovation policies such as Austria, Ireland, Portugal, Spain, Italy, Iceland and also Poland, Malta and the Czech Republic.

In Austria demand-side innovation policy is gaining ground that is mainly discussed in the context of public procurement and to a large extent triggered by European initiatives.

The main demand-side innovation policy measures in Portugal, introduced since 2009, are to be found in sectoral policies such as exploiting ICT opportunities in education and health, and on energy efficiency, including the electric mobility initiative. The recent Digital Agenda (covering five main areas new generation networks, better governance, excellence in education, health closeness, and intelligent mobility) relies on innovative public procurement initiatives.

In Spain, an innovation-based public procurement (IBPP) instrument was included in the State Strategy for Innovation (e2i) in 2009 but implementation started partially only in 2010.

Iceland has explicitly announced the use of public procurement as a policy tool to stimulate innovation. In the 2010-2012 strategy for RDI, the Council emphasises the need to involve users in innovation processes. In this respect, the Innovation Centre Iceland has developed a number of initiatives (like the Living Lab[23] initiative).

Demand-side innovation policies seem to becoming relevant also in Poland, Malta and the Czech Republic although more in the context of pilot initiatives or projects.

In Poland a project is being undertaken on new forms of public procurement co-financed by the Operational Programme Human Capital (2007-2013). The focus of policy attention is primarily on innovative public procurement. The project aims at

[23] http://www.nmi.is/english/entrepreneurs-and-sme-services/iceland-living-lab/

introducing changes to the public procurement process and a series of trainings are to be organised.

A draft position paper in Malta, prepared by MCST[24] in 2010, highlights the importance of supply-side and demand-side innovation policies, and places particular emphasis on their balance while recognising the limitations of demand-side policy measures in small economies.

Innovation policy in the Czech Republic is supply-side oriented, but with an increasing emphasis on the utilisation of R&D results in recent years. The most recent programmes have a clear shift though towards connecting public R&D support to collaboration with industry and thus to demand. BETA, a recent policy measure, aims to foster pre-commercial procurement addressing challenges in the public administration.

Despite the growing interest in demand-side innovation policies, the design and implementation of such instruments are still in an initial phase in many of these countries. Policies are often in a conceptual stage and less is being done in practical terms based on the reporting in the TrendChart mini country reports.

3rd Group: Limited policy discourse and/or actions

A third a group of 14 European countries display limited policy attention towards demand-side innovation so that the innovation policy debate is still strongly geared towards the supply-side. Within this group, in countries such as Hungary, Greece, Lithuania there is a limited ongoing policy debate mainly driven by European initiatives or sometimes by bottom-up actions[25]. In Bulgaria, Romania, Slovenia, Cyprus, Slovakia, Estonia and Latvia there is no evidence of a policy debate on demand-side innovation policies. France[26], Switzerland, Luxemburg and Liechtenstein have launched certain isolated demand-side innovation policy measures, nevertheless this is not reflected in current policy discussions or in an overall strategic approach.

In Bulgaria, Latvia and Lithuania, demand-side innovation policy has remained a relatively ignored issue despite some initial (Cunningham, 2009) policy debates started in 2009. While the subject is discussed in certain policy circles and examples of demand-side initiatives from other domains (such as environment or economic policy) exist, the demand-side is not a key focus of innovation policy. The policy focus in these countries is rather on fostering business innovation activities and linking academic and industrial research (which might have a certain demand-side policy element).

For example, the 2010 Lithuanian Innovation Strategy (LIS) makes reference to fostering 'demand-oriented innovations' and plans exist to conduct feasibility studies (on innovative procurement, renewable energy sectors, and intelligent transport systems) during 2011-2013. Despite such statements, demand-side innovation policy does not appear to be a strategic priority. In Greece demand-side innovations policies do not have a prominent place in the national innovation agenda, however, growing criticism of the large number of supply side measures might act as a catalyst towards the gradual introduction of demand-side measures. Hungary hosted a conference on pre-commercial public procurement under the Hungarian European Presidency in 2011 and the Science and Innovation Programme of the new Széchenyi Plan highlights pre-commercial procurement as a priority, but, so far, no support measures have been launched.

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[24] MCST 2010: National Strategic Plan for Research and Innovation 2010-2020, not publicly available.

[25] For instance the pre-commercial procurement initiative of the Eszak-Alfold region in Hungary http://www.pcp2011.eszakalfold.hu/

[26] France's 'Article 26' of the law on ' the modernisation of the economy', quoted as a good example in the 2009 TrendChart report on demand-side innovation policies, aims to facilitate entry for SMEs to high-tech markets, thereby also applying to the six lead market sectors

In Slovenia demand-side innovation policy is not a focus of attention either beyond debates in academic circles. Previously, there was a tax subsidy, whereby people could deduct a set amount from their personal income tax if they purchased items like ICT equipment or domestic appliances with lower energy consumption or invested in environmentally friendly construction/heating technologies and materials. Due to the substantial administrative burden, however, the tax authorities decided to introduce a non-selective tax deduction based on a percentage of average annual income. A green procurement action plan was adopted by the Government in 2009, and served as the basis for a draft decree on green public procurement in 2010[27].

The Estonian innovation policy framework does not include any public demand-side measures, although there are demand-side initiatives outside of innovation policy such as developments in e-services or e-mobility. For instance, the electric mobility programme aims to promote the use of electric vehicles as a mode of green transport (see also in section 3.4).

The demand-side is relatively unimportant in the Swiss innovation policy mix, with the exceptions of a recent revision of the Swiss Federal Law on public procurement or the SwissEnergy measure that fosters demand for clean technologies. French demand-side measures originate essentially from the 'Environment Roundtable' such as tax incentives to stimulate green consumption and favour environmentally responsible behaviour or information and awareness raising campaigns with eco-label and products energy consumption characteristics. Moreover, France's 'Article 26' of the law on ' the modernisation of the economy' was quoted as a good example in the 2009 TrendChart report on demand-side innovation policies (Cunningham, 2009) that aims to facilitate entry for SMEs to high-tech markets, thereby also applying to the six lead market sectors. Nevertheless, demand-side innovation policy is not a topic in France.

One observable trend is that in a number of countries, demand-side innovation policy has become an explicit part of recent innovation strategies even if it is often not labelled as such. It has to be kept in mind though that in a number of countries this is not the case and the emphasis remained on supply-side instruments. Even in countries with clear commitment, we find relevant debates about the way of implementation and the potential impacts of demand-side innovation policy tools.

In general, a relatively slow shift can be observed towards a demand-supply mix.

Regarding the geographical pattern of acceptance of demand-side innovation policy tools, it can be seen that in general Nordic countries are relatively more advanced, and they tend to develop strategic approaches.

More scattered experience exists in Western European countries, and while demand-side innovation policy is a 'hot topic', the basic approach and, in particular, specific tools are still contested.

There is a more recent movement towards these instruments in southern European countries; and many of the Central-Eastern European countries do not flag demand-side on their innovation policy agenda at all.

This is a simplified pattern, though since some of the countries do not fit into this general description: Poland is experimenting with demand-side innovation policy tools and the topic is strongly debated; Spain and Portugal are relatively more active in this domain in Southern Europe; France in the Western group does not put emphasis on demand-side innovation policy at the level of policy discourse and there has been a step back also in the UK with a debate on going on whether such measures are successful and in what format they should be continued.

[27] The Decree was submitted to the government by the Ministry of Finance for further processing, but it has not been adopted yet. http://www.mf.gov.si/si/delovna_podrocja/sistem_javnega_narocanja/predlogi_predpisov/

Figure 2. Relevance of demand-side innovation policy in the EU Member States and Switzerland, Norway, Liechtenstein and Iceland.

Strong policy discourse and experience	**Finland:** innovation public procurement, user driven innovation, regulation fostering innovation **Driving force**: TEKES	**Germany:** law to foster innovative public procurement, lead market initiative, standards, regulations **Driving force:** BMBF and the BMWi	**Sweden:** policy measures for public procurement of innovation, living labs, user-driven innovation, **Driving force**: Ministry of Industry, VINNOVA	**UK:** public procurement, SBRI, Forward Commitment Procurement **Driving force:** BIS, Technology Strategy Board, National Innovation Centre
	Netherlands: public procurement, SBIR, support to open innovation and user-driven innovation **Driving force**: new Ministry Economic Affairs, Agriculture and Innovation, Pianoo	**Denmark:** public-private partnerships, smart regulation **Driving force:** Danish Council for Technology and Innovation, Danish Agency for Governmental Management and Danish Enterprise and Construction Authority	**Belgium:** public procurement scheme in Flanders, tax incentives on solar photovoltaics, open innovation **Driving force:** IWT	**Norway:** industry and public R&D contracts, user-driven innovation (BIA) programme; **Driving force**: Ministry of Trade and Industry, Innovation Norway and the Research Council of Norway
Relevant policy discourse and experimentation	**Ireland:** procurement innovation group, national research prioritisation **Driving force**: Department of Jobs, Enterprise and Innovation of the Procurement Innovation Group, Forfas	**Austria:** public procurement of innovation, thermal renovation, green electricity support, green energy law **Driving force** Austrian Ministry of Economy, Family and Youth, Austrian Ministry of Transport, Innovation and Technology, Federal Real Estate Agency, ASFINAG	**Portugal:** innovation public procurement, Mobi.E. Taxa Zero Innovacion, Agenda Digital **Driving force:** Ministry for the Economy and Employment, Ministry for Health (General Directorate for Health)	**Spain:** public procurement of innovation, Innodemanda **Driving force:** Ministry of Science and Innovation, COTEC
	Italy: innovative/pre-comercial procurement **Driving force:** Ministry of Public Administration and Innovation and Ministry of Economic Development, which support regional policy (PON, POR) and regional actions, through its UVAL unit	**Iceland:** living labs, innovative public procurement, Electronic Reykjavik gateway, **Driving force:** Science Technology Policy Council	**Czech Republic:** pre-commercial public procurement **Driving force**: Ministry of Industry and Trade	
	Poland: training on public procurement of innovation, lead market type of initiatives **Driving force**: Public Procurement Office, National R&D Centre, Ministry of Finance and Ministry of Economy	**Malta:** green public procurement **Driving force**: Malta Council for Science and Technology		
Limited policy discourse and/or action	**Greece:** green procurement national action plan **Driving force:** Ministry of Environment, Energy and Climate Change and the key responsible is Ministry of Economic Development, Competitiveness and Shipping	**Hungary:** no current demand-side innovation policy measure, discussions about public procurement of innovation **Driving force:** Ministry of National Economy	**Lithuania:** law on public procurement, awareness raising actions **Driving force:** Ministry of Economy (together with the Public Procurement Office under the Ministry), the Ministry of Energy and the Ministry of Transport	
	Slovenia: action plan on green public procurement **Driving force: n.a.**	**Estonia:** public sector innovation, Electric Mobility Programme **Driving force:** Ministry of Economic Affairs and Communications	**Latvia:** no demand-side measures **Driving force: n.a.**	**Slovakia:** promoting public awareness for innovation **Driving force**: n.a.
	Romania: regulation, development of ecological market **Driving force:** National Authority for Sceintific Research, Regional Development Agency Bucharest-Ilfov	**Bulgaria:** no demand-side measures **Driving force: n.a.**	**Cyprus:** no demand-side measures **Driving force**: n.a.	
	France: public procurement, living labs, user-driven innovation, environment roundtable **Driving force:** General Directorate for competitiveness, Industry and Services (DGCIS)	**Liechtenstein:** law on energy efficiency, public-private partnerships, green procurement **Driving force**: n.a.	**Luxemburg:** public procurement, Hot City wireless network, law on IP, law on eco-innovation **Driving force**:Ministry of the Economy	**Switzerland:** public procurement of innovation, SwissEnergy measure, **Driving force:** Swiss Agency for the Environment, the Federal Financial Control, the State Secretariat for Economic Affairs

While the level of urgency and the implementation of corresponding measures are still very diverse, political commitment to demand side exists giving scope for more concrete policy support measures in certain countries in the upcoming period. To sum up recent references in innovation policy documents, it can be seen that:

- Germany's High-tech Strategy 2020 defines five 'demand areas' as mentioned above;
- The Finnish Ministry of Employment and the Economy published an action plan called 'Framework and Action Plan for Demand and User-driven Innovation Policy'[28] in 2010;
- In Norway the follow-up of proposals launched in the innovation White Paper emphasises that innovation in public enterprises in general and within the health sector in particular constitute a central and integral part of innovation policy (Ministry of Trade and Industry 2008);
- In the UK "the Blueprint for Technology and the first report of the Growth Review, The Plan for Growth encourages the use of procurement for innovation by continuing projects through the SBRI and other measures";
- Demand-side innovation policy is explicitly mentioned in the latest RTDI strategy of the Austrian government published in March 2011;
- In Ireland, the 'Innovation Ireland' report recommends the development of a number of flagship public procurement initiatives that could leverage Ireland's strengths as well as demonstrating the innovative use of ICT including next generation broadband;
- In Spain' innovation strategy 2011, demand side has been identified as an important element;
- The Czech "Strategy of the International Competitiveness of the Czech Republic 2012-2020" explicitly mentions the need to stimulate so far very limited demand on innovation in the domestic business sector;
- The Lithuanian Innovation Strategy (LIS) adopted in 2010 for the first time mentions an intention to foster 'demand-oriented innovations';
- In Malta it is expected that the new 2011-2020 R&I Strategic Plan which is currently part of a national consultation process led by the Malta Council for Science and Technology (MCST) will highlight the increasing importance of demand-side measures for Malta's innovation policy-mix;
- Pre-commercial procurement appears among the priorities of the Science and Innovation Programme of the New Széchenyi Plan in Hungary.

As Figure 2 reflects, the use of demand-side innovation policies is more wide-spread in countries of well-established innovation systems, but this is not at all a pre-condition. Demand-side innovation policies do not require to follow a learning curve, nor is it the preserve of countries of a strong innovation performance. It appears rather to be a question of policy choice.

3.2 Drivers and barriers

The drivers and factors influencing the momentum of demand-side innovation policies are manifold. There appears to be an opposition between (a) increased pressure to use innovation policy to tackle societal and economic challenges and (b) perceived economic and fiscal barriers to the wider use of demand-side innovation policies.

On the one hand, societal **challenges** such as climate or demographic changes are a **focus of concern in recent innovation policies**, which creates room for the introduction of demand-side measures. In areas such as the greening of the economy, energy supply or in healthcare, this mission or challenge driven approach towards

[28] http://www.tem.fi/files/27547/Framework_and_Action_Plan.pdf

innovation policy is often coupled with actions to raise public (and/or private) demand for specific innovative solutions.

Current efforts towards specialisation by focusing on selected themes and technologies (such as the demand areas in the German High-Tech Strategy 2020, the 'top sector' approach in the Netherlands or the spearheads in Flanders) and the quest for socio-economic exploitation of research results are further drivers that can give rise to a mix of demand-supply measures including systemic policies, support to creativity and user driven innovation. For instance in Flanders, the new 'Flanders Innovation Centre' aims to give an impetus to demand-based innovation policy by focusing on societal challenges and economic transformation. In the Netherlands, the popularity of demand-side measures coincides with a recent shift in policy in which subsidies are no longer perceived to be the most effective way to stimulate innovation. The use of public procurement, regulation and standardisation as well as user-driven programmes is encouraged also in the prioritised 'top sectors'.

The focus on mission-oriented approach, cluster policies, specialisation and bottom-up initiatives hint at the development of a more systemic approach combining demand and supply side measures. Demand-led policies are increasingly integrated in a 'whole innovation trajectory' approach where missing links, such as demonstration projects, are addressed in order to bring innovation to the market.

On the other hand, the current public budget deficits place **limits on the enthusiasm to use demand-side policy tools**. This appears to be the case in countries with a focus on public procurement of innovation, where many public authorities shy away from the higher entry costs of innovation and continue to be risk-averse and favour off the shelf solutions rather than procuring riskier development contracts (see for example the Icelandic mini country report). More generally, despite the apparent trend of the strategic rhetoric, there is still a hesitation about the concrete implementation of demand-side measures. European initiatives and pilot projects appear to have been catalytic, as the TrendChart mini country reports often refer to European level initiatives as inspiration and models.

In some countries there is a concern about "picking winners" or intervening too far upstream of a technological development. For example, in Germany there is a debate on whether to actively support certain innovations in the field of E-mobility by subsidising demand for certain types of electronic cars when it is as yet unclear which form of E-mobility will become most widely accepted. Indeed, some argue that the technology producers/innovators that focus on demand that emerged due to demand-side policy instruments may suffer from competitive disadvantages on international markets.

In several countries, the demand-side innovation policy debate appears in parallel to an increasing emphasis on creating more industry-led R&D policies. The border between demand-based innovation policy and market oriented, thematically focused R&D policies is thus blurred. Especially in Member States where system oriented innovation policy is more recent, the focus of the discussions lies in connecting science and business through thematic prioritisation or cluster policies.

The origin of demand-side innovation policies is very often environmental programmes and in many countries new instruments are developed first in this field and then rolled out into other domains. For example in Greece and Malta there is a move now to apply green public procurement. Even if those green procurement measures do not explicitly ask for the next generation of technologies, they accelerate the diffusion of the latest developments and by doing so contribute to innovation diffusion and innovation dynamic in green technologies. In Norway, the Environmental and Social Responsibility in Public Procurement Action Plan aims to ensure that the public sector leads the way as a responsible consumer and sources environmentally sound products and services, which have been manufactured in accordance with high ethical and social standards. Similarly, the 'Austrian Action Plan

for Sustainable Public Procurement'[29], (2010) stipulates that the procurement of products and services must meet criteria for sustainable innovative solutions.

Obstacles to the further spread of demand-side tools (as reported in the TrendChart mini country reports) can be grouped into legislative, governance and skills related barriers. The barriers relate largely to public procurement reflecting the emphasis put on this instrument. Interestingly, there are also references to 'philosophical' barriers that question intervention in market processes, however, there is no evidence that this is a general reservation.

Legislative barriers:

- A barrier often mentioned in the context of procurement and pre-commercial procurement is the conflict that suppliers of the prototypes are often excluded from later bidding for the actual product. In Belgium, innovators are not allowed to sell their products to those purchasers they have developed the product for; and that there is a disruption between the innovation and the actual adoption of these innovations. The same issue has been expressed in Denmark and in the Netherlands. In Denmark, the main argument is that such enterprises achieve unacceptable advantages in the competition with other enterprises.
- The basic legal framework for public procurement, for example in Slovenia, is the subject of criticism by both sides: the suppliers, who find the public tender procedures overly administrative and bureaucratic, as well as the government and public institutions, who need to apply 'to the letter' the regulations. The latter often complain about the inflexibility and wide openings for complaints by non-selected applicants, which often delay the processes and increase the costs. Adding an innovation component in the procurement is not seen as an advantage, especially since it is felt that in the Slovenian context it could lead to additional subjectivity in evaluation/ selection processes.

Question of intervening in market processes:

- A main conceptual obstacle reported from Germany is the issue of generating demand for innovation designs that later prove to be less efficient than alternative designs as already mentioned above.
- In Germany, public procurement of innovation is sometimes considered sceptically. It has been argued that, first, innovations should meet the market test, especially on international markets. Public procurement follows strict cost-efficiency rules, which limit the possibility of public entities to demand innovations that are more expensive than standard products and cannot clearly proof super-performance. Moreover, public demand is sometimes seen as highly idiosyncratic that may result in innovations that only fit to a certain public user, but cannot be marketed elsewhere.
- In Ireland, both the Procurement Innovation Group and the Innovation Taskforce recognised the potential risks associated with innovative public procurement such as concerns on perceived waste of public funds.
- In Austria, there is a hesitation to intervene into autonomous market processes with insufficient information availability (e.g. through demanding 'wrong' standards or imposing regulations which are counter-productive to future needs and future technological opportunities).
- The government's legitimacy to choose several partner companies without opening a public tender can lead to disputes and resulted in a public debate in Portugal.

[29] www.nachhaltigebeschaffung.at/

- It has been pointed out in the Danish report, that demand-side driven innovation should per se be driven mainly by demand. In case the goals pre-defined by funding agencies are too narrow, they cannot take into account cross-thematic fields and new emerging areas.

Governance and administration related barriers:

- In Greece, the issue of a fragmented public procurement market makes it difficult to stimulate demand for innovative products. A classic example of public procurement to stimulate innovation is related to defence procurement. However, despite the fact that the acquired technologies have not been leveraged for the development of civilian products, some of the demand-side policy can be deemed unsuccessful.
- In Poland, the absence of financial means for the acquisition of intellectual property rights has detrimental effect on the interest among the suppliers to use the public procurement. The public sector does not pre-finance the projects, which makes it extremely difficult for suppliers of innovative solutions to finance projects by their own means. Whilst there are barriers resulting from the lack of interest and knowledge among the suppliers, the approach adopted as well as experience within the public administration is not conducive to the use of public procurement in supporting innovation activities (Grupa Doradcza Sienna, 2007).
- The key barriers in implementing demand-side policies in Finland are perceived to be the small domestic markets and to some extent the dispersed local government sector.
- In the Czech Republic, the main barrier is the lack of coordination between the processes of creation, transfer and use of new knowledge. This weakness is most notably felt in inadequate linkages between public research and business sectors.

Lack of skills:

- Panasiuk and Kloda (2010) concluded that the Polish public sector could actively promote the use of public procurement as a tool for supporting innovation activities. Yet, the biggest challenge is to ensure the selection and training of relevant personnel who will be engaged in such process.
- A recently published comparative Nordic study (Weihe, 2011) found that there is a need for improved skills among procurement officers and knowledge and expertise matter, which could lead to more creative and innovative solutions as pointed out in the Danish report.
- Lack of practical concepts and reliable tools regarding innovation procurement are reported to be an important draw-back in Austria.

The above-mentioned factors are influencing views on the future of the demand-supply side policy mix. Demand-side policies are 'trendy' but the lack of experience and expertise slows the translation of policy discourse into concrete policy measures.

3.3 Instruments and interventions

The focus of demand-side innovation policy instruments is primarily and predominantly on public procurement and more recently on pre-commercial public procurement. Based on the TrendChart mini country reports, out of the 31 countries investigated 16 have identified explicit innovative public procurement measure, pre-commercial procurement measures or planning of such measures (see Figure 3. below). There are also cases where innovative public procurement is embedded in specific laws such as in Germany, Iceland or France and several further examples are identified in the area of green public procurement.

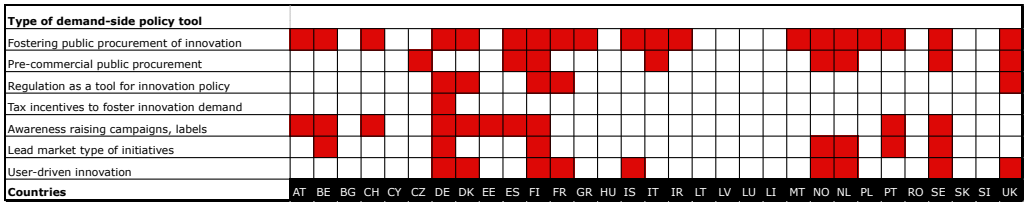
Regulation, standardisation and tax incentives to steer demand towards specific innovative products are part of the policy debates in the UK, Germany, the Czech

Republic and Portugal, for example, but in general their explicit use for innovation is less common. Tax incentives, it has to be noted, are still largely understood as R&D tax incentives on the supply side, and taxes incentivising purchasing behaviour and consumer demand have been rarely identified by the TrendChart mini country reports.

Lead market types of initiatives are mentioned in the country reports mainly in relation to the focus put on public resources on selected sectors/grand challenges, but there is no pattern of explicit 'lead market initiatives' being launched beyond the example of Finland (where an operating model is being drawn up for the national development of lead markets) and Germany (as part of the High-Tech Strategy; see below, section 3.3.5). Popular themes flagged in the country reports are, for example, eco-innovation/energy, e-mobility and healthcare, but generally refer to initiatives that have some lead market type aspirations, but are not labelled as such.

Support to user-driven/user-centred innovation is also a focus of policy discussions in certain countries, although concrete support measures can be found more often in northern Europe, where user-centred innovation is promoted such as in Denmark or Norway.

Figure 3. Broad overview of type of demand-side policy tools and their use in the countries covered



Clearly not all support measures are designed within the domain of innovation policy or with an articulated innovation objective even if they influence clearly the demand for innovation. As highlighted above, this report does not aim to give a complete assessment of such policy measures. One example, however, reported from Germany is the electronic health card that stores the health history of citizens. This initiative is expected to result in a demand for a range of other innovative devices of the telecommunication and computer equipment industry.

The following section brings some examples of recently introduced or successfully applied demand-side policy instruments pointing to some of the trends but does not pretend to provide a full overview of measures introduced.

3.3.1 Public procurement of innovation

As pointed out above, public procurement of innovation is the most popular demand-side policy support measure. Existing policy measures exist include, for example, the Forward Commitment Procurement in the UK, the PIANO[30] expertise centre in the Netherlands, the innovation in public procurements measure in Finland, innovative public procurement in Flanders or the innovation-based procurement in Spain. Policy makers in Austria, Poland, Ireland, Iceland, Lithuania and Malta have been reported discussing the possibility for new measures in this field in 2011. The general justification for those measures appears to be the potential power in public demand influencing innovative activities, whereby not only the size of the demand, but the leverage effect of public policy objectives is seen to be a driving force.

[30] More information is to be found on the website of PIANOo: http://www.pianoo.nl/about-pianoo/.

Importantly, there is a range of different kinds of interventions for public procurement of innovation, ranging from more or less elaborated guidelines, awareness-raising and training measures to complex, explicit innovation driving measures (composed of several stages and usually steered by an innovation agency).

For example, in Austria an inter-ministerial task force is developing a new concept guideline for public procurement that aims to stimulate innovation to solve societal challenges, to modernise public infrastructure, to force innovation in the public sector and to create reference markets. A broad ex-ante estimation of the Austrian innovation relevant public procurement exists, which amounts to €0.8b to €2b annually[31] that would complement the supply-side public funding for RTDI of €3.3b.

The Lithuanian Innovation Strategy Action Plan for 2007-2013 set the objective to promote the adoption of innovative procurement and intends to carry out a feasibility study in 2011-2013 on the adoption of innovative procurement practices. Similarly, Poland plans to launch training on innovative public procurement that would involve 500 procurers, 1500 representatives of SMEs and 1,000 business intermediary organisations. In Ireland the Procurement Innovation Group advises on solutions to challenges in procurement process impeding the procurement of innovative products.

Innovation procurement is embedded in the article 26 of the 'Law for the Modernisation of the Economy'[32] (decree in 2009) in France and in the 'Law against Restraints on Competition' in Germany that allows public authorities to set additional requirements from contractors towards innovative solutions.

The UK Forward Commitment Procurement model is designed for the public sector and its approach is to look at purchasing from the outcome based specification need instead of purchasing for the immediate perceived need. The following projects are running: Wakefield Metropolitan District Council looking into a park drainage solution, Rotherham National Health Service Trust looking at future ward lighting solution, Nottingham University Hospital low carbon energy solution. However, while successful examples exist, the measure itself has not been rolled out in a meaningful way as yet.

The Finnish 'Public Procurement of Innovation' measure targets the improvement of social services and healthcare. The measure is composed of a strategic stage (design of the procurement) and the operative acquisition. TEKES provides funding for the design of public procurement contracts of innovative products between 25% and 75% of the total costs. The programme contains the possibility to get technical and legal assistance for innovative procurement.

Spain has approved a regulation on Innovation-Based Public Procurement and recently published guidelines. This regulation implies that all ministries and public bodies have to specify the assigned budget for the purchase of new innovative products, goods or services in their annual budgets and multi annual strategic plans. The objective is that in 2013 the public procurement of innovative goods and services should reach 3% of the overall state budget in order to promote, as mentioned in the Spanish Innovation Strategy, the development of new innovative markets.

In Flanders, an Innovation Platform has been established, for market consultation and technical dialogue between the procurer, knowledge centres and companies. The platform's role is to crosscheck the innovativeness of the procurement needs with state-of-the-art technological developments in the field. It assesses the effectiveness of other available policy instruments and seeks to identify synergies in an early stage between policies. Moreover, it also helps the procurer to identify the beneficiaries

[31] BMWFJ und BMVIT: Entwicklung eines österreichischen Leitkonzepts für eine innovationsfördernde öffentliche Beschaffung. Vortrag an den Ministerrat, 97/13 vom 6. April 2011.

[32] http://www.legifrance.gouv.fr/affichTexte.do;jsessionid=?cidTexte=JORFTEXT000019283050

(direct, co-operative vs. catalytic procurement) and the position in the innovation trajectory (R&D vs. adaptation of existing products).

Another example of a measure for innovative procurement is the Danish MindLab[33], a cross-ministerial innovation unit launched in 2007 by the Ministry of Economic and Business Affairs, the Ministry of Taxation and the Ministry of Employment. The approach of MindLab is to assist the ministry's key decision-makers and employees to view their efforts from a citizen's perspective and implement a co-creative method. It continuously carries out a series of specific projects, where ministries are helped to develop and test new ideas and solutions. MindLab involves citizens and businesses in creating new solutions for society addressing the particular issues of entrepreneurship, climate change, digital self-service, citizen's rights, employment services and workplace safety.

The above are promising examples of innovative public procurement. However, public procurement for innovation is by no means a generally accepted element of the innovation policy "tool box", as half of the countries surveyed in this report do not have yet an explicit measure. Further, there are no systematic evaluations done yet on measures to promote innovation procurement or the general shift of procurement towards innovation in the countries, which apply these practices. In the mini reports and the documentation of the responsible ministries and agencies, there are claims that the innovation procurement measures are successful and most of them are being continued or further developed.

3.3.2 Pre-commercial public procurement

Pre-commercial public procurement is a relatively new instrument and its popularity is growing in the EU Member States partly encouraged by EU level initiatives. It has a strong demand element in-built, but its support is to the supplier of an innovation and the actual uptake by public bodies is not automatically in-built.

The two front-runner measures in Europe in terms of pre-commercial procurement are the pioneering SBRI/SBIR measures in the UK[34] and in the Netherlands. The US Small Business Innovation Research Programme inspired both measures; which are coordinated by a government agency (the UK Technology Strategy Board and the NL Agency respectively) and implemented in collaboration with the procuring authorities. The key objective of both programmes is to foster the procurement of research and development, which contributes to solving a socio-economic challenge. However, while the UK measure addresses the concrete functional needs of public sector organisations, the Dutch model is based on a focus on certain societal challenges. A specificity of the SBIR programme is that it is also applied for catalytic procurement where the private sector is the main end user.

The common feature of these measures is a three-step implementation structure composed of a feasibility stage, product development and the actual procurement. The process usually starts with the identification of a challenge where a governmental organisation is seeking a solution in the format of innovation procurement plans or masterplans. Some of the schemes seek to improve international competitiveness and have a more or less explicit focus on SMEs. It is one challenge of those schemes to transfer the demand for a solution and the investment in generating a solution into concrete purchase and roll out.

The measures are mostly implemented in close cooperation between an innovation agency responsible for the measure and the contracting authorities that formulate the

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[33] http://www.mind-lab.dk

[34] In the UK, the National Innovation Centre of the National Health Service applies a pre-commercial procurement measure that slightly differs from SBRI approaches as it is mainly focused on organising a multiple step approach together with the final public purchaser and in principle lets the IP with the purchasing agency to use for future tenders and a roll out of procrement of the developed product.

need for innovations and launch the tenders. The focus is sometimes laid more on the renewal of the public sector (such as in Finland) and sometimes the emphasis is rather on the support provided to SMEs (such as in the UK). Several of the measures have a history in green public procurement.

More recently, Spain, Sweden and the Czech Republic launched R&D procurement programmes and Italy is aiming to launch a measure in the end of 2011.

In the Czech Republic, a programme called BETA will run during the period 2012-2016 to procure research, experimental development and innovation at the demand of public administration bodies (nine ministries or other state bodies). The main objective is to gain new knowledge and skills, to enhance current practices, methodologies, regulatory mechanisms, surveillance activities, as well as improving services and information management products and procedures that will be used by the state administration and will lead to greater innovation and effective allocation of public funds. The results of this procurement, including intellectual property rights, may be owned and used only by state bodies that defined the research topics and ordered a specific solution reflecting their needs. The first call of the BETA programme was launched in February 2011.

In Sweden, VINNOVA launched a pilot measure in May 2010 that co-finances the acquisition of R&D services, up to a maximum of 50% of the total cost. There are plans to roll out this measure in the future. One of the positive features of the measure is the pooling of expertise around the procurement of innovation including specific innovative procurement methods such as "forward commitment" and catalytic procurement.

The Spanish Innovation Based Public Procurement has two different variations, the first one on pre-commercial public purchase (of know how), where the public bodies contract R&D based services and they do not appropriate the technological results themselves, but, rather, share the risks and benefits of those results –not previously available in the market – with the firms.

A pre-commercial public procurement measure is under preparation in Italy by the Department for Cohesion Policies of the Italian Ministry of Economic Development responsible for Structural Funds and by the National Agency for Innovation. The idea is to encourage regional ministries of research and innovation to set aside money for this measure using their budgets from Structural Funds. As planned, the first stage will be composed of a consultation process and dialogue between the regional ministry for research and innovation, the procurement authorities and the users themselves. The pre-commercial stage would be financed by 100%. The contracting authorities would finance the procurement only. Guidelines are also being prepared to address how to use public procurement for innovation.

Pre-commercial public procurement measures are in an initial phase or are just being launched and it is not possible to draw many conclusions about their success yet beyond the promising first results of the Dutch measure as its recent evaluation showed (Technopolis Group, 2010). In general, it appears that one common challenge of the measures is to commit the public body carrying the initial need to actually purchase the product developed through the measure.

Figure 4 Existing and planned measures in the area of innovative public procurement and pre-commercial public procurement (based on the TrendChart mini country reports)

	Country	Existing scheme			Plans	
		IPP	PCP		IPP	PCP
1	Austria					
2	Belgium (Flanders)					
3	Czech Republic					
4	Denmark					
5	Finland					
6	Iceland					
7	Ireland					
8	Italy					
9	Lithuania					
10	Malta					
11	Netherlands					
12	Norway					
13	Poland					
14	Spain					
15	Sweden					
16	UK					

3.3.3 Regulation

A large number of regulations affect innovation activities. Often, the impact of regulation on innovation is implicit rather than explicit, setting the framework conditions for businesses to operate. The bulk of regulation activities impinging upon innovation is done outside the realm of innovation policy and is technology and industry specific. For instance, in Bulgarian, there are examples of regulations used to promote the uptake of existing products such as in the field of e-services, payment methods, e-government, but innovation was not the intended purpose of the regulations.

In Finland and Denmark a recent trend is to regard regulations in a wider context than within R&D activities (Ministry of Employment and the Economy, 2010 and FORA, 2010) and to foster smart regulations that encourage user-driven innovation.

In Denmark, the Danish Business Strategy on Climate Change formulates a regulation code for the climate and environmental areas and regulation as a tool for innovation support is part of its most recent innovation strategy (FORA, 2011). In Denmark FORA has issued a report on 'How intelligent regulation can become an active element in Danish innovation policy' and analysed the effects, processes and mechanisms related to intelligent regulation. The report concludes that intelligent regulation cannot stand-alone: it is crucial to regard intelligent regulation as one of many tools that should be supported by other initiatives, such as public procurement. The correlation between regulation and innovation can go both ways: regulation can stimulate the development of new technologies, but new technologies can also help to create market opportunities and market failures that require changes in the regulatory framework.

Several interventions in the area of regulations have led to positive impacts. Deregulation in the health sector in Sweden has increased the market for services and is regarded as a relatively successful driver of innovation reform. In Germany, the Law on Renewable Energy was a key instrument to stimulate innovation in the production of renewable energies and contributed to Germany's current leading position in the diffusion of electricity production from wind and solar energy. The Austrian Green Energy Law (see more details in section 3.6) is regarded as a good practice that has the objective to increase the share of renewable energy, to reduce greenhouse gases, to mitigate the negative effects of climate change, to efficiently use the available funding instruments and to support the development of green energy technologies to reach marketability. The green energy law and its support instruments are expected to help reaching Austria's benchmark of 34% green energy share of total energy supply in 2020. In Finland examples in the field of wastewater and energy exist such as the Government Decree on Treating Domestic Wastewater in Areas Outside Sewer Networks (2004) and the Government decree on determination of electricity supply and metering (2009), which both include element that support innovation as a way to address the issues set in these decrees. Regulation in favour of innovation was tackled indirectly in the French "Environment Roundtable" (Grenelle I in 2007 and Grenelle II in 2009) that is a legislative package of 57 measures targeting the energy sector, the building sector, the transports sector, the biodiversity sector, governance and environmental and health risks.

Regarding the more recent plans in the field of regulations, Norway is planning to introduce regulations on green electricity certificates in 2012 targeting innovation in the energy sector and inducing new investments. An important trend outlined in the Dutch report is that direct financial support in the form of grants is to be reduced, while generic indirect support (e.g. tax incentives, deregulation, etc.) is promoted.

In terms of assessing the impacts of regulations on innovation performance, there are ongoing or existing actions in a number of countries. An experimental project in Finland is planned to be carried out related to the 'Framework and Action Plan for Demand and User-driven Innovation Policy' by the Ministry of Environment that will analyse the links between regulations and innovation performance. Another initiative will promote the awareness about the impact of regulation on innovation and preparing recommendations on taking innovating perspective into account in regulation.

In the UK the Department for Business, Enterprise and Regulatory Reform (now BIS) published a study on Regulation and Innovation: evidence and policy implications [35] in 2008. One of the paper's major findings is that the impact of regulation on innovation is influenced by the way in which new proposals are designed, implemented and enforced. For example, government is more likely to promote, or at best avoid hampering beneficial innovation if it clearly informs businesses of future changes in regulation well in advance. That would allow sufficient time to comply with new rules and requirements while being clear in specifying the desired outcomes which cannot always be achieved using existing technologies and business practices (BERR, 2008). The paper notes that the findings of the study were used to develop a number of practical suggestions which could ensure that the potential impact of any new proposals on innovation is taken into account at all stages of the policy making process. One outcome was a voluntary checklist of regulatory principles for promoting innovation (see Helping Regulators to Promote Innovation, published in 2009[36])."

The country reports' evidence suggests that there is no visible trend to investigate explicitly the role of regulations on innovation, nevertheless, the sectoral examples

35 BERR Economics Paper No. 4, December 2008, http://www.bis.gov.uk/files/file49519.pdf

36 http://www.bis.gov.uk/assets/biscore/corporate/migratedD/publications/C/Check_list_for_regulators

reveal that regulations are abundantly used to drive innovation forward in areas such as eco- industries for example.

3.3.4 Supporting private demand

The rationale behind the support to private demand is that an important barrier to the commercialisation of innovation is customers uncertainty about security and quality of the new product, reluctance to pay the price early in the diffusion cycle, learning costs of adaptations as well as the lack of business infrastructure and networking effects in early phases of radical innovations (Edler, 2011).

Initiatives supporting private demand are scattered and to be found more in specific sectoral contexts (see also in section 3.4). As already mentioned, tax incentives for the purchase or use of innovations seem not to be very common as innovation policy tools, and most often, existing tax incentives are oriented towards R&D, supporting the supply side. A full review of broader policy areas, such as energy or environmental policies, might find a higher number of tax measures to foster the diffusion of innovation. Nevertheless, some countries do plan to introduce demand-side tax incentives. For example, the Czech Republic plans to include the purchase of R&D results for innovation in a tax incentive and Portugal is about to launch a measure of 'Zero Tax Innovation'. Although these tax incentives have an R&D target and supply orientation for the moment, they might be expected to intervene at the demand-side and on innovation as well at a next stage. Iceland introduced a tax reduction measure for R&D active companies and now is planning to introduce tax measures for innovative purchases as well. In Poland companies are able to deduct expenditures on new technologies from the tax base. The new technology is defined as technology knowledge, in particular R&D results, which allows the production of new goods or improvement of products/services and is not implemented on the world markets more than five years. In Denmark in 2011 a new tax incentive for promoting R&D activities in firms has been introduced that is to mobilise private demand not only for research and development but also for innovation.

Sectoral specific tax incentives can be also identified, such as in Flanders with a tax break for the purchase of solar photovoltaics or in the Netherlands where tax incentives are used to mobilise private demand in the case of low-emission vehicles.

Eco-innovation related taxes are also very common, such as for example in France with tax incentives to stimulate green consumption and favour environmentally responsible behaviour and in Belgium where the eco-tax law covering a range of products and introducing eco-vouchers represents a wage premium focusing on environmentally friendly consumer goods (it is given to all employees and exempted from the income-taxation).

The country reports identify other examples of support measures to private demand such as for example demand-side subsidies, catalytic procurement or awareness raising initiatives. Thermal renovation was included in Austria's economic stimulus package, which was created to absorb the negative effects of the financial and economic crisis in 2009. €100m were provided by the government to subsidy thermal renovation activities of households and companies, which generated an investment volume of € 667.5m.[37] This instrument considerably contributes also to CO2 reduction and reduced the thermal heat demand by 46%. Thermal renovation support will be continued until 2014 with a yearly budget of around €100m.

Catalytic procurement has been used in the case of new generation networks in Portugal. The Mobi.E initiative 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 infra-structure for charging

[37] Österreichischer Wirtschaftsbericht 2010

batteries and for informing potential users about charging posts availability. It may be envisaged as an initiative to build a lead market. The procurement of charging stations and the launch of the charging network pilot is expected to result in the creation of a market for new goods and services that can generate new business opportunities for companies.

3.3.5 Systemic policies

Systemic approaches represent strategically coordinated measures, which combine various demand-side instruments or supply-side and demand-side policy tools (Edler, 2011). There are few examples of explicit 'lead market initiatives' at national level. The German High-Tech Strategy explicitly mentions the goal to create lead markets, intensify cooperation between science and industry, and continue to improve the general conditions for innovation. Moreover, in Finland, an operating model is being prepared now for the national development of lead markets, which is planned to be completed in 2011. Lead market types of initiatives (but not called as such) can be found mainly in relation to the focus put on public resources on selected sectors/grand challenges.

The German 'Top Clusters' initiative supports R&D networks consisting of public research, technology producers and technology users, and it integrates user requirements and speeds up the process of commercialising new technologies. Another German initiative called 'Innovation Alliances' is a new instrument of public support to industrial innovation that has some features of a systemic innovation policy approach. It provides funding for strategic cooperation between industry and public research in key technology areas that demand a large amount of resources and a long time horizon, but promise considerable innovation and economic impacts. Through a public-private partnership, the Federal government co-funds R&D and other innovation-related activities for specific, long-term co-operative R&D projects, involving also enterprises that are likely key users of the technology. Public funds are complemented by significantly larger amounts of money from industry. Each innovation alliance is set up through an industry initiative, is organised as a long-term co-operative research project and involves several industry partners as well as public research organisations. So far, nine innovation alliances have been established with a total budget of almost €3b.

Systemic approaches are also applied to tackle societal challenge. For example the legislative package called "Environment Roundtable" in France can be regarded as an example of systemic policy combining several demand-side instruments. Among the measures are tax incentives to stimulate green consumption and favour environmentally responsible behaviour, information and awareness raising campaigns with eco-label and products energy consumption characteristics, green procurement with public purchases of electric cars, eco-building or organic food for public schools. It aims at supporting the energy sector, the building sector, the transports sector, the biodiversity sector, governance and environmental and health risks. Another approach that can be flagged is the Danish Business Innovation Fund created in 2009 that aims to promote growth, employment and export by supporting business opportunities within green growth and welfare.

Other examples of lead market type of initiatives are scattered. For instance, in Greece, that only lead Market initiative so far adopted is at the regional level in Western Greece in the areas of e-health, protective textiles, sustainable construction, recycling, bio-based products and renewable energies. In Ireland, the Exemplar Communications Test Bed project can be considered as a flagship/lead market initiative, in which the Department of Communications, Energy and Natural Resources is funding (€5m in 2010) the development and use of next generation broadband based on technologies developed by Irish high technology companies.

Besides the explicit use of procurement or regulation, policy interventions that embrace both supply-side R&D funding or innovation support and industry-focused elements influencing the demand for innovations appear more and more on the

palette of innovation policy. This trend follows the emphasis put on fostering public-private partnerships, although it has to be noted that these policy measures still remain strongly supply-side. The country reports suggest that a large number of countries seek to develop linkages between business and academia, even if this entails sometimes an indirect demand-side intervention (involvement of industry in development projects).

Such indirect integration of demand-side element into RDI support programmes is represented, for example, in the Romanian 'Plan to increase the efficiency and effectiveness of RDI expenditure'. The Plan was adopted in 2010 by the Romanian government with the objective to maximise the social and economic impact of RDI investment and receive a part of the EU's financial assistance. It introduced also some complementary incentives to be defined in consultation with industry representatives beyond the priority action lines, such as increase of RDI public and private investment to 2% of the GDP, and increase of private RDI investment. In Poland, a relatively new initiative the 'National R&D Centre' (2010) is responsible for scientific research programmes that are aligned with industry demand. The project called 'Advanced technologies for energy generation' is expected to prepare technological solutions, which will enable achieving a 20% x 3 improvement of energy efficiency, increase a share of renewable energies, and reduction of CO_2 emissions. The focus is on clean coal technologies, which will include scientific research activities with an emphasis on the results that have the highest chance of application and full implementation.

A recent explicit systemic approach is the Concept Note on 'Flanders Innovation Centre' in Belgium (May 2011) that provides a new basis to a demand-led innovation policy by stating that innovation should be guided by societal challenges and the need to transform the economy. Therefore the concept of 'innovation crossroads' has been introduced to focus innovation policy on six domains in which these challenges meet the scientific and technological strengths of Flanders. Efforts are made to further develop the innovation procurement measure that will address these domains as well.

The Danish Enterprise and Construction Authority published a report on public private partnerships, in which it has been highlighted that instead of a traditional buyer-supplier relationship, innovation public-private partnerships can offer a joint way to work towards innovative solutions. The Danish Government has also allocated DKK 100 million funding pool for PPP-projects (Innovationsrådet, 2009).

3.3.6 Support for user-driven innovation

User-driven innovation policy promotes the deeper understanding of user needs and strengthens the users' role in innovation activities (Ministry of Employment and the Economy Finland, 2010). The concept is promoted predominantly in the Nordic EU countries and relatively new support measures can be identified specifically addressing user involvement in innovation processes.

A specific type of support to user-driven innovation is the living lab concept that means the creation of innovation platforms where users can be involved in the development of new products and services. An example is in Iceland, where a living lab was set up in 2010 with the objective to stimulate collaboration between users and producers in the development and use of goods and services and to strengthen cooperation agencies and the private sector in research and development.

In Finland, demand-side policy is connected with the approach of user-driven innovation and user-driven innovation has been integrated into the Framework and Action Plan for Demand and User-driven Innovation Policy (2010) and follow-up measures can be expected.

An important measure in Norway is the User-driven Research based Innovation (BIA) programme established in 2006 that targets industry. Similarly, the Danish Business Innovation Fund provides grants to help companies become more user-driven and develop user-driven innovations, administered by the Danish Enterprise and Construction Authority. In 2010 two sectoral ministries have started new policy

measures with the involvement of users oriented towards demonstration, testing and maturing of innovative technological solutions: the Ministry of Climate and Energy started GreenLabs DK, and the Ministry of Food, Agriculture and Fisheries started the Green Development and Demonstration Programme. The previously mentioned MindLab initiative is also a support measure that fits under user-driven innovation category.

3.4 Sectoral specificities

Although demand-side innovation support measures tend not to have sectoral specificities as such, a challenge-driven approach to demand-side innovation policies can often be identified in several cases targeting specific societal challenges or sectors, thus the sectoral/thematic approach in demand-side innovation policies are strong (as it can be also seen from the sectoral/thematic orientation of the above-mentioned examples of interventions).

There are certain sectors in which demand-based policies inducing innovation or diffusion of innovation are more important and which are more likely to benefit from horizontal demand-side innovation policies. Clearly the areas in which demand side measures to stimulate innovations are most common are environmental and energy technologies, followed by healthcare, mobility, education, communication and security[38].

Rather than listing all sector oriented activities, which is clearly beyond the scope of this report, the example of eMobility initiatives as launched in a range of countries (Estonia, Germany, Portugal, the Netherlands, and Lithuania) and the case of green procurement illustrate the range of sectoral activities.

In Estonia, the launch of the programme 'Electric Mobility Programme' by the Ministry of Economic Affairs and Communications created a big debate in the society and it was taken as an extreme innovation as the use of electric cars is not very popular yet in Estonia due to the relatively high price and people normally have doubts towards everything new. The implementation body KredEx has launched the open call for the purchase of the electric cars in July 2011.

E-mobility is also a priority of the German Federal Government's strategy in energy innovation as already mentioned. Through the national E-mobility initiative, the aim is that the German automotive sector will adjust to systemic innovation and continue to lead global innovation in the automotive sector. Among the measures implemented so far are increased R&D efforts in the area of batteries (e.g. Innovation Alliance on Lithium-Ion batteries) and related technologies.

In the Netherlands, it was announced in June 2011 that (semi-) electric vehicles will obtain fiscal benefits and that a 'Green Deal' will be presented to stimulate the growth of this market, e.g. via electric busses and taxis and facilities for charging batteries.

During 2011-2013, the Ministry of Transport in Lithuania intends to carry out a feasibility study on the development of electric vehicle market. The study will explore the future market needs, impact on the electricity infrastructure, urban infrastructure, required legal system and technologies, and other issues. Aside the feasibility study, the Ministry of Transport also plans to prepare a plan for the development of the electric vehicles charging stations.

The Mobi.E programme in Portugal aimed 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 infra-structure for charging

[38] This is also in line with the statements of the 'Innovation Union flagship" saying that public procurement represents an important market, particularly in areas such as health, transport and energy.

batteries and for informing potential users about charging posts availability. It may be envisaged as an initiative to build a lead market.

Green procurement is gaining a strong foothold for example in Iceland, Spain, Greece, and Slovenia, and existing measures can be identified in Norway, Austria, Malta, Estonia and France. The law on public procurement (84/2007) in Iceland contains references to green procurement and an agreement was signed on eco-friendly public procurement in 2009. The Spanish Law of Sustainable Economy (2011) promotes innovative public procurement, especially in the areas of green economy, energies and the protection of the environment.

3.5 Governance challenges

Demand-side policies should complement rather than substitute supply-side measures. Innovation policy is most effective if support for the generation of innovation is combined with complementary policies improving and increasing the demand for innovation. For this to happen, however, requires efficient policy coordination, alignment in administration and good governance. The management of an effective demand and supply side measures mix is not easy, since it requires appropriate mechanisms for ensuring a more consistent policy design, for assigning the funds, and for coordinating the implementation of measures.

The governance challenges to be overcome in order to make correct decisions about the area of demand to focus on and to identify the right instruments are manifold. The challenges lie in strategic intelligence and market knowledge on the one hand and in the complexity of stakeholders involved and coordination amongst them on the other (Edler, 2010).

One source of complexity is the high number of organisations or government departments involved both in the planning and implementation of demand-side innovation policies and by the fragmentation of stakeholders. The complexity is reflected not only in the numbers of stakeholders but in terms of the multi-level governance involving cooperation between regional, national and European level of actions. In Poland for example, the organisations involved are the Marshal Offices, Ministry of Science and Higher Education, Ministry of Economy, Polish Agency for Enterprises Development, National Bank of Economy (BGK), National R&D Centre (NCBiR), commercial banks, Ministry of Regional Development and different European Commission services, etc.

Moreover, there is an element of picking solutions at certain points in time. However, to foster the diffusion of a certain technology in a certain point in time needs a sound knowledge about the technological trajectory, to avoid lock-in to a technology that is premature or for which accompanying business infrastructure is not ready. The governance challenge here is to have a mechanism for strategic intelligence and knowledge generation about technological and market trends. Moreover, the formative and summative evaluation of demand-side measures poses challenges that require further methodological and conceptual development and new approaches both in policy making and evaluation practice (Edler et al 2012).

To tackle the above-mentioned governance challenges, different approaches exist, but they are not yet systemic. They focus largely on the coordination challenge, rather than on the intelligence challenge.

Germany, Finland, Denmark integrate **demand-side policy elements directly into the thematic R&D programmes that aim at developing** new technologies and new scientific findings that can stimulate future technology development. The main approach is to bring together producers and potential users of new technology in early stages of technology development in order to accelerate the process of commercialising new technologies. By close interaction of the two sides, technology producers can learn about the specific user needs and adapt their innovative processes to these needs. At the same time, potential users become aware of new technologies

and their innovative potential and are more likely to demand and extensively use the opportunities of innovations.

In Finland, the policies to develop lead markets are design in a broad-based manner together with the supply side instruments. In practice the main link is the Innovation Department at the Ministry of Employment and the Economy that coordinates innovation policy activities in Finland at the operational level. In Denmark, an effort is made towards a more systemic approach to linking supply and demand aspects via the establishment of public-private partnerships.

In the Netherlands, the various departments responsible for sectoral innovation policies, for regulation or for public procurement impede the coordination of demand-side policies. The new Dutch super-ministry EL&I with more coordinative tasks in innovation policy, is seen as promising solution in the future.

Another example of alignment again from the Netherlands is **inter-departmental coordination** such as in the case of the pre-commercial public procurement scheme, in which various ministries collaborated. The Dutch Ministry of Economic Affairs took the initiative in launching a pilot SBIR programme and in convincing other ministries that pre-commercial procurement was a relevant policy instrument. An inter-departmental group was established to facilitate and promote the uptake of SBIR. In 2007, the (temporary) inter-departmental 'Knowledge & Innovation' (K&I) programme department took over this role[39]. NL Agency, the innovation agency in the Netherlands, managed the SBIR programme for all the ministries that have issued a call for tender under SBIR.

In Austria, an **inter-ministerial task force** has been established under the joint leadership of Austrian Ministry of Transport, Innovation and Technology and the Austrian Ministry of Economy, Family and Youth, which includes other ministries, the Federal Procurement Agency, the Austrian provinces and communities, further stakeholders according to the Austrian public procurement law (like public and private sectoral awarding authorities) and also representatives of the side of potential contractors (innovation oriented enterprises, especially SMEs).

The coordination mechanisms may lie in **joint development projects** at a more ad-hoc basis involving the relevant stakeholders, as it is sometimes the case in Finland.

Another solution is the **Spanish Innodemanda** programme that combines innovation public procurement as a demand side policy with the traditional supply side instrument based on support for business R&D in the form of low interest credits of the Centre for Industrial Technological Development (CDTI). A fast dynamic procedure to obtain support for R&D of the CDTI will be developed and will assure the simultaneous approval of the public purchase and the support of the CDTI to prevent only one of them being approved. Therefore, the proposal for support to the CDTI has to be presented after the publication of the tender for public goods. In this case the CDTI evaluate the proposal and will announce their decision before the end of the deadline to present the offerings for the tender. This means that the CDTI has around six weeks to evaluate the proposals.

While coordination between supply and demand side is not very elaborated in general, it is often the case that there is an **unintended but fruitful overlap between demand and supply-side innovation policy** in targeting a certain sector without having an explicit link or articulated alignment of objectives between the two. For example, in Austria the development of 'passive houses' was supported both by public R&D funding, and at the same time, the subsidies for thermal renovation raised the demand side independently from the R&D measure. In Belgium (Flanders), since both

39 K&I had been established to improve interdepartmental coordination in innovation policy, to develop a long-term strategic agenda and to coordinate and stimulate the development of societal innovation programmes. K&I was dissolved by the new Cabinet in 2010.

types of instruments can address societal issues, they often overlap without an original purpose. An interesting question for research would be to investigate the joint impacts of different supply and demand-side instruments in specific sectors. In Lithuania, although unintentionally, the Ministry of Economy via the Lithuanian Business Support Agency has aligned the research and innovation support measures (financed by the Structural Funds) with the demand-side measures by providing support to a number of R&D projects carried out by companies operating in a solar energy technologies cluster, which aims to develop a solar energy sub-sector in Lithuania.

The key institutional drivers of coordinated demand-side innovation policies are usually ministries of economy, economic development or innovation, together with innovation agencies. Lead players in driving the innovative use of public procurement forward include institutions with significant procurement budgets, such as sectoral ministries or other organisations responsible for the delivery of public healthcare services etc.

Several examples can be identified where the **regional level pioneers steers the policy attention towards demand-led programmes**. These cases are not only relevant in federal type of countries with strong regions, but also in other more centralised countries. In Hungary, the Eszak-Alfold Regional Development Agency initiated discussions and a new measure about pre-commercial public procurement (not launched); Romania and Bulgaria among several other regions are involved, through the Regional Development Agency Bucharest-Ilfov, respectively through the North Western Bulgaria region in the project "EU Regional Cooperation for SMEs access to Public Procurement – EuroPROC". In Italy, demand-side innovation policy is receiving attention mainly as pre-commercial procurement by the Ministry of Public Administration and Innovation and by the Ministry of Economic Development, which support regional policy (PON, POR) and regional actions, through its UVAL unit.

3.6 Practices of demand-side innovation policy interventions

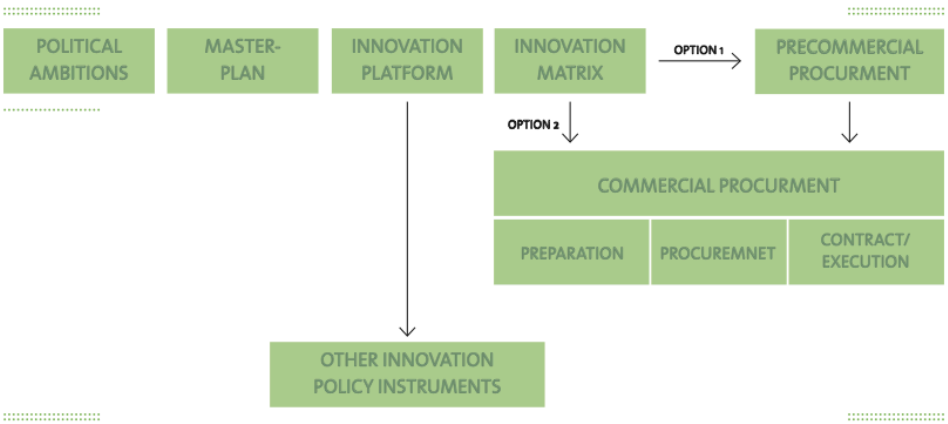
To illustrate some of the detailed mechanisms of certain demand-side innovation policy measures or initiatives with demand-side element, some of the TrendChart mini country reports brought detailed examples of concrete practices that are presented in this section.

Case 1: Procurement of Innovation (Flanders)

The instrument "Procurement of Innovation" aims at fostering innovation in Flanders, in order to improve international competitiveness and to deal with societal challenges. The instrument is the outcome of a period of preparation by the innovation agency IWT with consent of the Flemish government. In the first stage (2006-7) the PoI was nurtured under the flag of an environmental innovation platform (MIP). In that period, the concept of PoI was developed and adjusted to the Flemish context. It resulted in a Flemish manual for procurement of innovation, and eventually to the launch of a pilot measure. In the period after that (2008-11) the instrument was implemented government-wide, targeting 13 ministerial departments as procurer, while companies and research institutes are to provide the innovative services or goods.

All departments of the Flemish government are included in the PoI measure. The PoI model consists of an integrated public procurement trajectory, ranging from the initial demand of public bodies to the final commercial procurement. The following figure[40] presents a graphical overview:

[40] Image taken from the report of the FP6 OMC PPT-project: Exploring Public Procurement as a Strategic Innovation Policy Mix Instrument.



Three important stages are to be distinguished:

- *Composure of the Masterplan, ensuring high quality of demand.* All thirteen ministries of Flanders are invited to develop a masterplan. The drafting of such a masterplan goes as follows: In line with the *political ambitions* of the ministry a vision is created about a desired future, dealing with a societal problem or a challenge to the public body. Based on this problem analysis a list of requirements for desired innovations is composed. Preferably, Key Performance Indicators are designed that articulate the level of performance that is demanded from the innovation.
- Secondly, *an Innovation Platform is established, for market consultation and technical dialogue between the procurer, knowledge centres and companies.* The aim of the Platform is to crosscheck the innovativeness of the procurer's procurement needs (given in the master plan) with state-of-the-art technological developments in the field. It assesses the effectiveness of other available policy instruments (under IWT supervision) and seeks to identify synergies in an early stage between policies (e.g. procurement and complementary tax or standardisation). In a second phase, the platform helps the procurer to draft an *innovation matrix:* identifying the beneficiaries (direct, co-operative vs. catalytic procurement) and the position in the innovation trajectory (R&D vs. adaptation of existing products).
- *Commercialisation trajectories are realised.* If R&D is needed, the ministry starts a *pre-commercial procurement trajectory* with different participants that conduct R&D. Participants will develop prototypes, which are tested by the government. After the research phase the government initiates a *commercial procurement procedure* for full implementation of the innovation. This phase is carried out with respect to procurement rules (see 3.3).

The PoI pilot was approved by the Flemish government in July 2008 and is a first implementation of an integrated approach to procurement of innovation. All departments of the Flemish government have started pilots or are currently developing these. The budgets for this instrument are: €10m budget for the Minister responsible for innovation policy for the pre-procurement phase, and a maximum €1m for each other Minister for co-financing of PoI

As of now, pilots are launched in culture (e-book and ICIS), health care (eye screening), public works (monitoring for building excavations), agriculture (sustainable horticulture), general government (visualisation of public roads), and projects are currently started up in other departments as well. Although it is too early to appraise the effects of this measure, the pilot was followed by a positive response from all governmental departments. Full roll-out of the measure is planned in near term future (2011).

Considerations to include the PoI pilot as a good practice are:

- The measure has an integrative policy approach and enables all ministerial departments to procure innovation; this opens many opportunities for policy mixes. Moreover, budgets were allocated to the minister responsible for innovation, as well as for the other ministers, thus creating ownership at several governmental levels.
- The measure has an integrative innovation approach, acknowledging different phases in innovation trajectories, as well as the systemic nature of innovation. Both pre-commercial procurement and commercial procurement is targeted by the measure. Even more important, innovation agency IWT is involved in finding synergies with other innovation policy instruments, so that demand-side measures are flanked by supply-side measures if necessary.
- The design of the measure and the implementation of it were well-prepared; this has avoided disillusions (regulatory issues, mismatch of ideas, managed expectations). As a result it seems that Flanders was able to take the hurdle of Art. 78 (see 3.3).

For further information: Website (both English and Dutch) or this short description.
Source: INNO Policy TrendChart/ mini country report Belgium, 2011

Case 2: 'Green energy law' in Austria

The objective of the green energy law is to increase the share of renewable energy, to reduce greenhouse gases, to mitigate the negative effects of climate change, to efficiently use the available funding instruments and to support the development of green energy technologies to reach marketability.

The green energy law and its support instruments should contribute to reach Austria's benchmark of 34% green energy share of total energy supply in 2020.

Different delivery methods are employed, such as investment allowances for small hydro power stations, but the main financial engineering system is subsidised fixed line entry-tariffs of green energy into the energy supply systems. These subsidised entry-tariffs are financed by the consumers and the electricity dealers through higher transfer prices.

For managing the financial support a green energy management organisation (OeMAG[41]) was established in 2006.

The target group s of the law and its financial instruments are economic suppliers of green energy, especially in the field of wind energy, biomass, biogas, small hydropower stations and solar energy.

Through the support of green energy through subsidised entry-tariffs, technological progress in terms of efficiency could be attained, whose success can best be seen in terms of wind energy and small hydro power stations. Here technological progress enabled almost to draw level with market prices. This attainment, however, depends mainly on the volatile commodity market prices of traditional energies, especially raw oil. The distance of subsidised entry-tariffs and real market prices could also be reduced in the field of biomass, but still almost doubles the market price (in 2008)[42].

By 30 June 2011, 6,027 green energy stations (plus 1,699 small hydro-power stations) had a contract with OeMAG. They produced 1451,6 megawatt, which is an increase of 10% compared to 2006.

For further information: http://www.e-control.at/de/marktteilnehmer/oeko-energie (in German)

Source: INNO Policy TrendChart/ mini country report Austria, 2011

Case 3: National Research Prioritisation Exercise (NRPE) in Ireland

The National Research Prioritisation Exercise (NRPE) represents a good practice example of using data on emerging global markets/industries in influencing the identification of priority areas for government STI funding.

The aim of the NRPE project is to identify a number of priority areas and approaches to tackling national challenges and opportunities (henceforth to be referred to as priority areas) around which future investment in publicly-funded STI should be focused. The project will take account of future economic and social opportunities and fields of research activity where Ireland has built significant strength to date. An action plan for each of the areas identified will be developed. These action plans will set out specific goals to be realised in the medium term (5 years) and beyond and the measures required to realise these goals.

The NRPE process is being carried out by Forfás under the guidance of a High-Level Steering Group.

The early stages of the NRPE initiative *involved an extensive scanning of key global markets and industries* to identify those areas where Ireland should concentrate its limited resources. Forfás collected a range of *evidence-based data including global market opportunities, growth markets and the positioning of Ireland's enterprise base based on synthesis of existing sectoral reports and direct engagement with development agencies such as IDA Ireland and Enterprise Ireland, and a wide range of industry representative groups in Ireland.*

These demand-side data were key inputs to the deliberations of the four NRPE thematic working groups that comprised representatives from industry, academia and public sector bodies.

Do's lessons:

In addition to using evidence-based data on future global market/industry trends, the involvement of industry representatives within the NRPE process is seen as vital in underpinning a demand-side focus.

The NRPE is expected to conclude in October 2011 with the publication of a report identifying priority areas, from an economic and societal perspective, which need to be underpinned by future investment in publicly

[41] http://www.oem-ag.at/

[42] http://www.e-control.at/de/marktteilnehmer/oeko-energie/zahlen-daten-fakten/kosten-der-oekostromentwicklung/einspeisetarife

funded STI.

For further information, visit the web site of Forfás which is undertaking the national research prioritisation exercise: **www.forfas.ie**
Source: INNO Policy TrendChart/ mini country report Ireland, 2011

Case 4: Electronic Reykjavik gateway

Reykjavik was committed to pave the way to customer service with three kinds of access. First, the service centres in neighbourhoods. Second, provide telephone access information from all different areas of the city. The third and most innovative way was to provide the service electronic Reykjavík where citizens could have access to services on 24/24 basis.

All kinds of services are offered over the internet, after registration of course of the citizen. The services range from school registration to building/renovation applications and even permit application for example related to tobacco use. The introduction of electronic processes and communication services to the population of Reykjavík has many benefits. A very interesting option that the gateway offers is to "activate" the population to participate in discussions and opinions about issues across the city. The applications are numerous.

The electronic platform was developed by a company called Idega. Idega software has in the last few years undertaken large and intricate projects where the affiliated parties have come together for a finalised solution. The City of Reykjavik procured an innovative solution that was co-developed together with Idega. The result was the Idega strengthened its position by developing a competitive advantage (almost all municipalities in Iceland work with Idega today).

For further information: http://rafraen.reykjavik.is/pages/?iw_language=en and http://idega.is/pages/?iw_language=en

Source: INNO Policy TrendChart/ mini country report Iceland, 2011

Case 5: Public procurement measure Finland

The value of public sector procurements in Finland amounts to approx. €27 billion annually. Simultaneously, the public sector faces severe financial and social challenges that necessitate improvements in the productivity and the quality of services. By expecting innovative solutions and introducing new products, services, operating methods and technologies, the public sector will be better equipped in coping with the future challenges. According to Tekes, "The Innovations in public procurements is aims at developing new innovations, renewing public services, and improving productivity by more innovation friendly public procurements. Ideally, the public sector would be involved in creating new markets."

Innovations in public procurements –measure aims at promoting innovations in public contracts by means of funding, networking and cooperation between different actors. While direct funding is granted to the development costs of the participating projects, also seminars and other networking events play a crucial role in the realization of the measure.

The funding is targeted at all Contracting Authorities of the public sector. Tekes funds the planning of public contracts aiming at renewal of services and activities. Typically the funding covers 50% of the total project costs. Although all Contracting Authorities are welcomed to apply for funding, a successful candidate needs to have an opportunity and a need to develop services and activities over the long term, an ability and resources to implement an innovative procurement, and willingness for and strategic commitment to large-scale renewal of procurements. In addition it is required that the scale of the procurement must be large enough to have an impact on the development of the sector, at least on a regional level. Dialogue with the end-users and tenderers is also expected. Second-phase funding is available for those Contracting Authorities that need funding for research, development, and innovation activities that are part of a public procurement.

While the possibilities of public procurement in creating innovations followed by improvements in the quality and efficiency have been discovered long ago, are initiatives the field still rare. While single municipalities have renewed their procurement methods, have nationally significant measures not existed.

According to the preliminary results of the evaluation of the measure, the measure has been successful in supporting the realization of innovative procurement. However, the transformation of the working methods in the procurement units, or diffusion to the whole organization, was considered slow.

Do's:

- Focus on marketing in the beginning of the measure – it is worth to invest in finding the best possible candidates.
- Invest in sector specific know-how and personal counselling and guidance.

Don'ts:

- Do not forget the importance of bench-learning and networking. Especially when all projects are piloting something truly new, the possibilities to learn from each other's mistakes and successes are

indispensable.

- Do not underestimate the resistance to change. Especially when working with public organizations, the implementation of new procedures can take some time.

For further information: http://www.tekes.fi/about/publicprocurements#top_of_content (in English)
Source: INNO Policy TrendChart/ mini country report Finland, 2011

4. Conclusions

There is a general trend in strategic documents and policy measures towards more demand-based approaches; and compared to the 2009 reporting review this policy is more prominently featured across the board.

A first observation is that in a number of countries demand-side innovation policy has become an explicit part of recent innovation strategies. Several experiments and pilot projects to test new approaches are going on or are being planned. This is true despite on-going debates as to where the boundaries between supply and demand-side measures are and what kinds of interventions are legitimate and appropriate. However, a majority of countries still largely focus on supply-side instruments.

Countries have taken up the new wave towards demand-based measures in different ways and to different degrees, in some there appears to be some lip service without a real definition and design of measures. Even in countries with a clear commitment, there is an on-going debate and some scepticism towards certain type of demand side instruments and the way to implement them. In general, it is still too early to say whether demand-side type of activities meet the expectations, if they will be continued and in which form in the future.

As for types of measures, there is a strong focus on innovative public procurement and more recently popularity for pre-commercial procurement. The former is mainly about training, guidelines, general appeals to procurement practice; the latter are dedicated measures with different implementation mechanisms and different leeway, as to the uptake of the innovations produced. Regulations remain important influencing innovation activities, however, they remain very much in the domain of sectoral, industrial policies and not explicit part of innovation policy. Support to user-driven innovation is an emerging approach within demand-side policy, but concrete support measures are not common.

Green technologies have been a particular focus of current demand-side policies. Particularly, green public procurement is recognised as priority and efforts are driven towards increasing the share of green public procurement in total procurement.

There are indications of more systemic policies, combining different demand-based instruments or even demand and supply side approaches. This ranges from demand led supply-side policies, whereby supply support is focused on areas with a clearly defined demand (e.g. societal challenge) to lead market type of mixes focused largely on the demand side itself with some underpinning supply side support. This points in the right direction, indicating that in the future interventions might be designed in a more holistic approach, focusing on the specific context of challenges and sectors rather than launching trendy but isolated innovation policy initiatives.

However, there is a danger, as always when new trends diffuse through European policy making, that demand-based measures are rolled out prematurely and with high transaction and learning costs. Support in understanding the challenges and opportunities of various forms of measures is needed, the discussions, e.g. in Germany, show that there are different conceptual understandings as to a roll out of demand based measures which need to be taken seriously. Only an “intelligent learning” rather than a policy copying can make the roll out of demand based measures successful. To that end, the EU can provide a test bed (as it does with pre-commercial procurement and the lead market initiative). It is essential that the challenges of those policies and the importance of context and accompanying policies are stressed, and evaluations of early applications should be widely shared and discussed.

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technopolis |group| Belgium
Avenue de Tervuren 12
B-1040 Brussels
Belgium
T +32 2 737 74 40
F +32 2 727 74 49
E info.be@technopolis-group.com
www.technopolis-group.com