



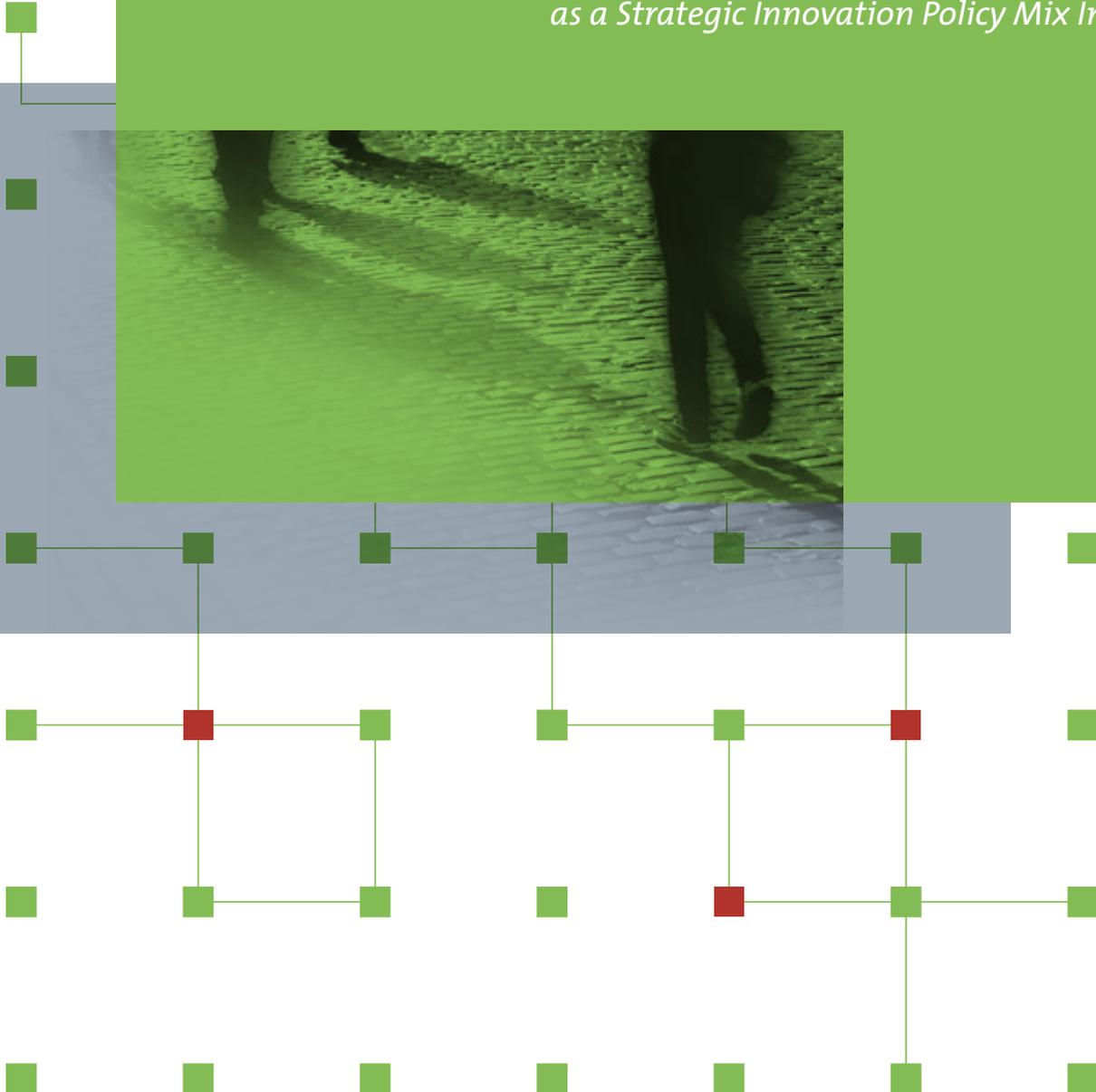
Funded within the 6th Framework Programme
of the European Commission

OMC  PTP

EU PROJECT OMC-PTP

Public Technology Procurement as a Strategic Innovation
Policy Mix Instrument

Exploring
**Public
Procurement**
as a Strategic Innovation Policy Mix Instrument



Disclaimer

The views expressed in this document are purely those of the writers and may not, in any circumstances, be interpreted as stating an official position of the European Commission.

The European Commission does not guarantee the accuracy of the information included in this study, nor does it accept any responsibility for any use thereof.

Reference herein to any specific products, specifications, process, or service by trade name, trademark, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by the European Commission.

All care has been taken by the authors to ensure that they have obtained, where necessary, permission to use any parts of manuscripts including illustrations, maps, and graphs, on which intellectual property rights already exist from the titular holder(s) of such rights or from his or their legal representative.

Background

This manual has been developed within an Open Method of Coordination (OMC) funded by the European Commission within the 6th Framework Programme. OMC is a European initiative which enhances the exchange between Member States by making recommendations, e.g. “soft law” measures that can be implemented at European level in the context of the Lisbon strategy. The OMC expert group on policy measures considers public procurement as one of the most powerful instruments to achieve the Lisbon target. Therefore in order to enhance mutual learning, identify good practice, and start joint policy initiatives, including community initiatives, it is important to have an OMC for public procurement. The OMC process highlighted the need for the development of practical tools to encourage the sharing of good practice in public procurement. This can be achieved through mutual learning between Member States, stakeholders, and procurement officials.

More information is to be found at: www.omc-ptp.eu

Contents

Executive Summary	5
1. Introduction	7
2. Actor Perspectives in Public Procurement	11
2.1 Roles in public procurement of innovation	11
2.2 Public procurement of innovation at different levels of the demand side	13
2.2.1 Policy makers	13
2.2.2 Public procuring authorities	14
2.2.3 End-users: the public	17
2.2.4 Sector differences	17
2.3 Public procurement of innovation at different levels of the supply side	18
2.3.1 Policy makers	18
2.3.2 Potential suppliers and their stakeholders	19
3. Public Procurement: an Instrument for Policy Makers?	21
3.1 Rationales for stimulating innovation by public procurement	21
3.1.1 Economic and industrial policy rationales	22
3.1.2 Science, Technology and Innovation (STI) policy rationales	23
3.1.3 Domain specific or sector specific rationales	23
3.1.4 Conflicting rationales	23
3.2 Public procurement as part of the innovation policy mix	25
3.2.1 Demand based innovation policy and the need for a coordinated approach	25
3.2.2 Challenges for public procurement to become part of innovation policy	27
3.3 Using different forms of public procurement within innovation policy	28
3.4 Conclusions on public procurement as an innovation policy instrument	29
3.5 Policy on public procurement of innovation in Europe and EU Member States	30
3.5.1 European Commission: discourse, studies and initiatives	30
3.5.2 United Kingdom	30
3.5.3 Sweden	33
3.5.4 The Netherlands	35
3.5.5 Belgium (Flanders)	37
3.5.6 Germany	38
3.5.7 France	40
3.6 Conclusions and recommendations	42
3.6.1 Conclusions on policy developments	42
3.6.2 Recommendations to (innovation) policy makers	43

Excursus – SBRI UK and SBIR Netherlands	45
4. Challenges in Designing the Procurement Process	47
4.1 The Preparation Phase	48
4.1.1 The Contracting Authority’s long term strategy: the master plan	48
4.1.2 Market consultation: Structuring the interaction between contracting authority and market	49
4.2 The Procurement Phase (with special focus on pre-commercial procurement)	51
4.2.1 The special case of pre-commercial procurement	52
4.2.2 Alternative commercial procurement methods for innovation involving R&D	56
4.3 The contracting/execution phase (with special focus on IPR issues)	59
4.3.1 Price and intellectual property rights	60
4.3.2 Basic IPR principles related to pre-commercial procurement	61
4.3.3 IPR models	61
4.3.4 Value engineering	63
5. Concluding remarks	64
ANNEX – Cases	65
Belgium <i>e-ID card</i>	65
Belgium <i>Soot filters</i>	65
Belgium <i>Mobile Ticketing</i>	66
Belgium <i>Outdoor City WI-FI System</i>	67
Latvia <i>IPE-Magnetics</i>	67
Latvia <i>Institute of Polymer Mechanics – Material Testing System</i>	68
The Netherlands <i>Intelligent Speed Limiter for Delivery Vans</i>	68
The Netherlands <i>Energy Producing Greenhouses</i>	69
The Netherlands <i>Extension elevators</i>	70
Germany <i>Fuel Cell Buses</i>	70
Germany <i>Public Railcars with Particle Filters</i>	71
Slovakia <i>Group Video Conferencing System</i>	72
Sweden <i>Stockholm Road Tax</i>	72
Abbreviations	74
List of References	76
Websites	78

Executive Summary

During the last years the public sector in Europe has received much attention as regards to procurement. Reports have been conducted and recommendations have been given in order to enhance the purchase of innovative solutions by public authorities. As a consequence, the Member States are currently discussing public procurement of innovation as becoming part of an innovation policy.

Buying innovative solutions at public sector level comes along with great expectations, such as the creation of lead markets, boosting industrial innovation, better performing government, solving societal problems. However, this can only be achieved under two necessary conditions: a coherent policy and a professional public procurement process.

A coherent policy means a procurement policy that is an integral part of innovation policy and addresses all relevant (government) stakeholders in order to incorporate the will to buy 'new' throughout all government decision makers.

A professional public procurement process means structuring organisation, knowledge, and incentives in order to make procurement of innovation possible.

Deriving from these issues this document will explore the following challenges:

At policy level:

↳ *Defining the role of public procurement in relation to other innovation policy measures*

At operational level:

↳ *Exploiting the rules of the procurement framework with special attention to pre-commercial procurement*

We will show that only a balanced interaction between the policy making world and the operational world can lead to a public service equipped for procurement of innovation.

We will give recommendations for turning public procurement into a policy instrument for innovation that works at policy and operational level. They are based on current approaches in public procurement of innovation in six EU Member States including some practice examples.

These recommendations are in summary

At policy level:

↳ *Show high level political commitment: setting long term priorities and discussing why public procurement is a good way to address these priorities can turn it into an accepted policy tool.*

↳ *Analyse your actual innovation policy mix and investigate whether public procurement of innovation can contribute to your innovation policy goals. To that end also check the other policies that are related to innovation: industry policy, specific policy domains like health, mobility, environment, education etc.*

↳ *While incorporating public procurement as a demand based instrument in the innovation policy mix, make sure to balance it with the other demand side based instruments (tax measures, demand subsidies, clusters) as well as with the supply side instruments (subsidies, loans). Make provisions to allow the policy innovation mix to change as an innovation moves through the innovation cycle.*

↳ *Turn the image of public procurement into an activity where people are allowed to take risks and ask for new solutions that pull innovations.*

At operational level:

↳ *Develop a structure that enables the recognition of best practice examples in public procurement of innovation.*

↳ *Fully exploit the opportunities through contractual arrangements.*

These recommendations are for innovation policy makers and contracting authorities and will be further explored in the following document.

We say that value for money cannot be reinforced by law. Instead we emphasise the need of soft, non-legal instruments as well as the development of practical tools for procurement of innovation, in combination with other policy instruments, such as a national policy for public procurement.

1. Introduction

What is public procurement of innovation?

We define public procurement of innovation as the purchase of innovative products, services or processes through public demand with the aim to improve the performance and functionality of public services or to solve important socio-economic challenges. The purchase might include research and development.

As regards to innovation itself, we start with a practical definition: innovation is change for the better. Dany Jacobs and Hendrik Snijders use the definition: “innovation is the realisation of something new, with (hopefully) an added value.”¹

The degree of innovation can vary from “new to the world” over “new to a market” to “new to an organisation”. An innovation can be further characterised as disruptive or breakthrough, as forming a new (technology) platform or as gradual or incremental. Other variations are adaptive or integration types of innovations.

Additionally, an innovation can be positioned on the innovation cycle: it starts from an idea that is worked out in a concept and further results in a prototype. It can finally be validated in a pilot before entering into the market, where it diffuses. The success of an innovation is defined by its degree of diffusion. Without diffusion an innovation has no economic impact.

Public procurement of innovation can be supported by innovative procurement processes that stimulate the supply side to offer innovative solutions. This also enables sustainable growth and export opportunities for entrepreneurs.

Sometimes, the general discussion about public procurement of innovation seems to be rather disconnected from an understanding of how innovation typically occurs as defined by innovation theory. Here the distinction between incremental versus radical innovation is a good starting point. Incremental innovations can be seen as gradual improvements that take place through the entire life cycle of a product. Radical innovations, on the other hand, concern something radically new, i.e. something that creates a completely new trajectory. Typically incremental innovation takes place more often and almost continuously, while radical innovation occurs much less often.

Very few of the cases collected in the annex of this document, are really about radical innovation. Most of the procurement projects reported here concern incremental innovation. Some of these are innovations only in the sense that they are new to the country or region, i.e. that the procurement plays a role for diffusion of innovation, rather than innovation in a universal sense. Others of the examples reported on here, although they involve procurement of technology, may even be seen as procurement of regular goods.

Given the understanding of radical innovation as discussed above, the result of public procurement processes must to some extent be understood as determined by general technical developments in society. It can probably not be expected that public procurement per default should render radically new things in every procurement project undertaken. A reasonable and also probably beneficial measure for public agencies would be to continuously monitor the possibilities for procurement of both incremental innovation as well as radical

¹ Jacobs, D., Snijders, H.: Innovatieroutine, Van Gorcum, Assen 2008. The second definition expresses more nuance since not all innovation leads to a better world. Public procurement of innovation at least aims at a change for the better.

innovation, should possibilities for the latter occur. Many of the examples collected in this report contain such attempts to procure innovation in the sense that there was a choice: instead of procuring regular products, search processes for new knowledge were initiated, i.e. there was an ambition and in many cases clear support from the political levels for procuring innovation rather than regular already existing goods.

Roles in public procurement – introducing chapter 2

When discussing public procurement of innovation, it is important to acknowledge that several different groups of actors may be involved in different capacities. A few examples of different roles that actors may play are: as the origin of demand; as regulators; as procurement procedure experts; and as potential suppliers. Most public procurement procedures involve only some of the potential actors. When it comes to procurement of innovation however, where the risk levels tend to be elevated and the time horizon longer than for regular procurements, chances are that most of the actors need to be considered.

Chapter 2 will approach public procurement by introducing different actor perspectives and exploring their motivation for taking part in a procurement process.

Why policy makers are interested in public procurement – introducing chapter 3

In many countries public procurement has primarily been the domain of procurers and contracting authorities in the public sector. They are responsible for buying needed goods and services for public use against the best price. Why then, has this topic recently become interesting for policy makers? A starting point for answering this question may lie in the fact that the EU has passed three relevant regulations, the most recent ones in 2004, affecting the public and the utilities sectors. These regulations needed to be translated into national law by procurement policy makers in the EU Member States. However, this does not explain the interest from a wider variety of policy makers.

Policy makers from different domains like markets, innovation, environment, and information and communication technologies have come to hold an interest in public procurement. These policy makers have picked up the idea that public procurement can also be used for purposes beyond strictly buying goods and services for public use. Although the main objective of public procurement will remain buying goods and services for public use, simultaneously it can be a means to realise environmental objectives, improve the quality of health care services, or increase the innovative capacity of an organisation, a region or a sector. With these additional features, public procurement obtains a new quality and becomes a policy instrument that can be interesting for environmental, industrial, research, and innovation policy makers and other actors involved in the policy-making processes.

Chapter 3 will approach public procurement by analysing its possibilities to become part of existing policy making.

Strategic and tactical challenges of the procurement process – introducing chapter 4

On the strategic side one has to find an adequate balance between the use of procurement of innovation to stimulate innovation and the other demand-side and supply-side measures such as demand subsidies, tax instruments and R&D subsidies and more in particular which instrument or policy mix is most appropriate as an innovation moves throughout the innovation cycle. Subsequently there might be a strategic conflict between the procurement dimension of procurement of innovation that tries to stimulate competition cross-border and the economic/industry policy that has a more national focus trying to build sectors considered of strategic importance to a country with national champions that can compete with their innovative products/services on the international market.

The tactical challenges of procurement of innovation can have a different nature: they can be practical, have a legal character or are related to pricing/IPR issues. These tactical challenges can be listed according to the three different stages of a procurement process: the preparation phase, the procurement phase and the contracting/execution phase. Finally the transition between pre-commercial procurement and subsequent commercial procurement needs careful attention.

In summary, public procurement of innovation is characterised by three dimensions: the object of the procurement, the position of the innovation on the innovation cycle, the procurement position of the contracting authority.

The procurement directives and their translation in national legislation form the legal frame for the award of public works, products and services. R&D services are a special category of services. The procurement directives exempt research and development services from their scope, unless the services procured are fully paid for by, and the benefits accrue solely to, the contracting authority. The procurement of R&D services exempt from the procurement directives is called pre-commercial procurement.

Chapter 4 will approach public procurement by examining challenges and obstacles that might arise during the procurement process with special focus on pre-commercial procurement.

The structure of this document

The public sector, as is the private sector, is characterised by a strategic dimension and an operational dimension. The strategic dimension is filled by the policy makers whereas the operational level is taken care of by the public servants delivering services to the citizens to their best efforts. An efficient public service is the result of a balanced interaction between the policy making world and the tactical operational world. These two

dimensions are also found in public procurement and more in particular in public procurement of innovation. For that reason our document is structured along these two dimensions: the policy level and the practical procurement level. Based on this we focus with this document on policy makers on the one hand and on contracting authorities and their procurers on the other hand.

Practice cases confirm the findings of other studies that public procurement of innovation is not very much visible, not well structured and efficient tools are not in use to deliver innovative solutions to the challenges we are facing. At best several countries are making efforts to develop procurement policies for innovation and to give a systemic approach to procurement of innovation and to try out new procurement concepts.

Based on these findings our document focuses on policies and concepts topped with some own conceptual thinking. The aim of the document is thus neither to prescribe how policy makers should handle procurement of innovation nor how to procure innovation but more to present a dish to the readers from which they can choose the bits that are applicable in their national/local context.

In what follows we will explain that all necessary conditions and tools can be put in place to benefit from innovation while at the same time transforming the business-to-government (B2G) market into an attractive market for innovative companies.

The following chapters are constructed after the pattern: each chapter points out problem areas and proposes recommendations for improvement.



Icon for recommendations

The annex of the document provides practice examples (cases) that exemplify how public procurement of innovation is taking place in selected Member States.

2. Actor Perspectives in Public Procurement

This chapter attempts to present the issue of public procurement of innovation from the perspective of different groups of actors. These actors all have special motives for deciding whether to participate or not in public procurement of innovation, and in which manner to do it. Each group of actors will be discussed one by one, followed by recommendations or suggestions directed to that actor.

Much of what is covered here regarding policy actors and (partly) procurers will be discussed in chapter three, and partly in chapter four. For those actors, this section is therefore an introductory summary.

2.1 Roles in public procurement of innovation

The groups of actors that can be involved in the public procurement of innovation are listed below:

On the demand side:

↳ *The public, such as individuals or interest groups, which demands or expects certain public services.*

↳ *Policy makers on international, national, regional, and local level, who translate the demands of the public and their own political agenda into public purchasing needs as well as set up the legal framework for the procuring procedures;*

↳ *Procuring public organisations, that is, the public authorities which perform the actual procuring procedure. Such an authority contains three groups of relevant actors: management, internal users and procurers.*

Public sector policy makers exist at many levels: internationally, nationally, regionally, and locally. Although in reality, they differ widely in size and other ways, they are for the purpose of the manual divided into two sub-groups: national/ EU level and regional/ local level.

Public authorities can be divided into three subsections: management; internal users (public authority employees that need the procured products for their work) and procurers (public authority employees that are responsible for and organise procurement procedures).

End-users are the general public and economic actors that benefit from public authority operations.

On the supply side:

↳ *The companies competing for public procurement contracts, as well as owners and/ or stakeholders in the companies. Within a company, it is meaningful to separate between the roles of the management, and the sales and research and development departments.*

Policy makers are in this context interesting in their role as promoters of industry renewal with a view of creating economic growth.

The next group of actors is connected to potential supplier companies. There are three subsections here: stakeholders in the company, firm management and the research and development and sales departments. It is also possible to discuss intermediaries such as partner companies, consultants, agencies, distributors, representatives etc. They are, however, too diverse a group to include in a general description. Notwithstanding that, they do play a role in public procurement of innovation and are worth considering when dealing with specific procurement cases.

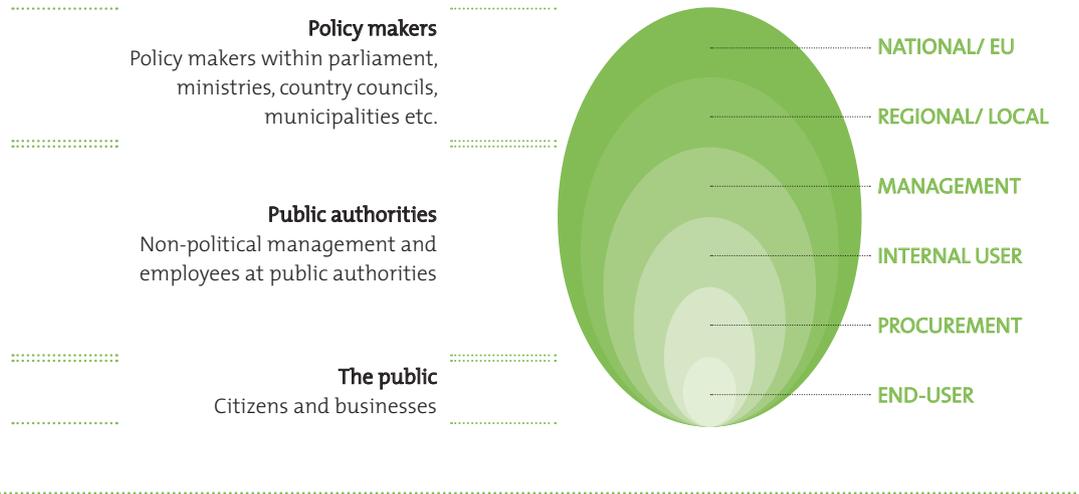


Figure 1
Roles in procurement of innovation – demand side

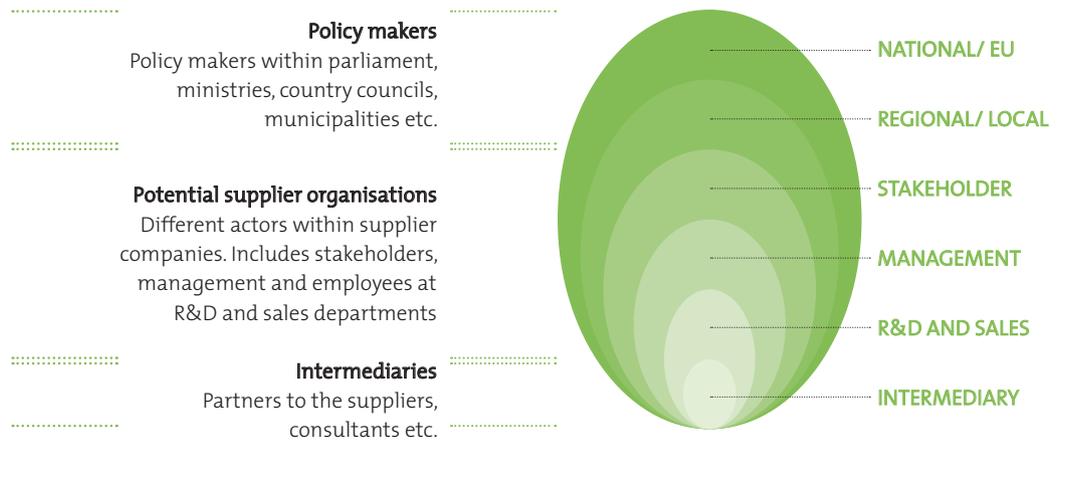


Figure 2
Roles in procurement of innovation – supply side

2.2 Public procurement of innovation at different levels of the demand side

2.2.1 Policy makers

Policy makers at the different levels aim at integrating different aspects in public procurement procedures. This will be discussed in chapter 3.

EU and national policy level

At EU level, the legal framework is provided. The introduction of EU regulations aims at opening national markets – an aim which is very much in line with the idea of the common market. At national level, policy makers are bound by principles of public households: they have to ascertain value for tax-payer's money by procuring products with the best price-value ratio (not to be confused with lowest price), which often limits the choice to – in fact – the cheapest bidder.

Apart from these considerations, policy makers at all levels must also consider political goals and whether public procurement can fulfil a role in bringing them about. For example, if societal goals such as energy efficiency or low pollution levels are important to policy makers at any policy level, they can formulate procurement specifications which include such a demand. Thus, regulation, political ambitions, and/ or societal considerations compete for the attention of purchase specifications and weight of evaluation criteria.

Today, one political goal that is receiving much attention among EU policy makers is innovation. Research suggests that public-sector needs and demand, translated into procurements, can contribute strongly to renewal, innovation and international competitiveness in the business sector.²

However, it may be felt that there is a built in conflict between innovation policy and the procurement regime. The latter is aiming at cross-border trade, whereas national/ regional/ local politicians will promote innovation policy to foster companies, in particular small and medium sized enterprises, in their own member states/ region or community.

Regional and local policy makers

Unlike the EU and national policy makers, lower level policy makers lack the possibility to change procurement regulation (and its interpretations) in order to achieve political goals. On the other hand, they collectively account for the majority of the public procuring volume in most EU countries. These policy makers can thus be very influential when it comes to e.g. creating collective demand of certain products, aiming for a common political goal, or lobbying to the EU and national level policy makers. Systemic innovation seems more likely at that level, as a coordinated discourse between policy makers; public procuring authorities and public procurers, market surveillance with potential suppliers and possibly also end-users can take place relatively easily in a regional or local context.

Recommendations

If policy makers desire that public services should enhance their activities in case of public procurement procedures, it is important that the latter should be given clear instructions and the necessary incentives for doing so. Policy makers will have to mark out clear positions and show a clear commitment to procurement of innovation.

To achieve this, policy makers should

- 1** *⇒ Co-ordinate different political objectives into a common policy, where innovation is one part (addressed by a policy mix of industry policy, specific policy domains, public procurement etc.).*
- 2** *⇒ Use the above to construct a policy instrument for public procurement of innovation and allocate institutional responsibility for it: long-term procurement objectives and commitments for innovation should be clearly set out and communicated and policy rationales must be articulated.*
- 3** *⇒ Develop methods for and offer support to contracting authorities to enable them to engage*

R

² It is important to note that public procurements not only can promote innovation, but also deter or hinder it. If public-sector organisations demand only existing goods and services, suppliers have little incentive to engage in development or innovation, especially, if the market in question is dominated by public demand. A situation where public invitation to tender documents specifies existing technical solutions makes suppliers unable to offer alternative new solutions in their bid. Thus, it is important to construct public procurements that effect development and renewal in a positive, and not negative, way.

in public procurement of innovation: for example innovative procurement methodology development (a tool box of procurement methods for public procurement of innovation and a guidance on when and how to use them), training schemes, risk exposure, management systems, information platforms for knowledge exchange, and dialogue between contracting authorities and suppliers.

4 ↳ *Set up incentive schemes or steering tools to encourage contracting authorities to buy innovations (e.g. allowing procurement of innovation-related savings to stay in the organisation, requesting that a proportion of the procurement budget should be used on innovative products, make best practise examples of innovative methods of procurement and reward them etc.).*

5 ↳ *Offer financial schemes for a) limiting risk for contracting authorities in procurements and for b) providing funds if procuring innovation seems to be more costly at the outset.*

6 ↳ *Organise pilot projects and encourage follow-ups of procurements of innovation procedures, to a) send the message that procurement of innovation is both important and possible, b) form a platform for procurement strategy decisions, and c) to build a valuable information database for comparing different approaches (including statistics; cases and international examples).*

7 ↳ *Encourage systemic innovation, that is, a coordinated discourse, between policy makers, public procuring authorities and public procurers, potential suppliers and possibly also end-users.*

Public procuring authorities

The role of a public authority is to provide the public with certain services, or in other ways to support public functions. Within the context of procurement, this implies procuring the products needed to carry out their mission in accordance with the demands made by policy makers and the needs of the public. The role of a public authority is thus more of executive character, compared to the strategic one of policy makers.

Strategy is still important to public authorities, e.g. in the matter of organisational renewal. To assure a qualitative service delivery to the public today and in the future, public authorities must consider, if and which new products and solutions it will need to do that. Procuring an innovation is one potential tool for public authorities to bring on renewal in its activities.

The way a public organisation behaves when acting as a contracting authority (i.e. in its role as a procurer) foremost depends on the EU and national regulations for procurement procedures, which must be followed. However, many steps in the procedures are left to the interpretation of the procuring authority. This gives leeway to other strategic considerations, apart from price-value which must always be fulfilled.

Like any organisation, a contracting authority does not have a single will. It is made up of different groups of actors that are inconsistent in terms of what they want to achieve and how to go about it. That means that many incentives, sometimes contradictory, are in play. Some are top-down, originating from policy makers and/ or the public. Others are bottom-up, come from within the organisation itself and normally vary according to organisational level. Below is a discussion on the main differences which needs to be taken into account to bring about a successful procurement of innovation.

Management (non-political)

One of the strongest incentives for the management to engage the authority in public procurement of innovation relates to investments needed for long-term development: to provide the public with technically

sustained goods and services. Here, procurement of innovation can have strong positive effects. Sometimes, however, long-term development stands back to short-term needs. One way of strengthening the authority's interest in being long-term and thus innovative is to consider using key performance indicators as a steering tool. If there is a difference between actual and desired performance, the likelihood increases that the management looks at tools such as procurement of innovation.

Procurement of innovation can be deployed in a broad way depending on the need of the authority, including breakthrough innovation, integration of innovation, incremental innovation, and diffusion of innovation. Also, contracting authorities can be involved in any of the three possible buyer positions: direct procurement, cooperative procurement, and catalytic procurement.

To function as a tool for long-term renewal, public procurement of innovation however needs to be embedded strategically by the management. This does not only include what products to procure for future purposes, but also how to plan the procurement procedure in itself. This might include obtaining information about the state of the art of technology, current research avenues or new prototypes, and to put the procurement of one product into perspective with other technical developments. In a more scientific way, it is good to request and perform an impact assessment of the procured product prior to the procurement.

Today, strategies and decisions on procurements are rarely addressed at management level in public authorities. Likewise, it is unusual for those in charge of procurement processes to be included in the authority's main decision-making processes. This contrasts sharply to the private business sector. There, purchasing executives are often part of the corporate management team and procurements form an integral part of the business strategies for both short-term efficiency and long-term renewal. If procurement is to have the same effect on organisational development at public authorities, the status of public procurement processes need to be upgraded and dealt with at mid or central management level.

While a better communication between the management and the actual procurers is needed, another point to improve is evaluation. Today, there is rarely a follow-up on a procedure, nor is there any impact analysis. Systematic impact analyses on past procedures and procured products would lead also to quantifiable socio-economic effects.³

One of the reasons why managers restrain from procurement of innovation is the high risk level; e.g. there is always the risk that the actual outcome may prove different from what was expected. The procured product might be delayed and/ or more expensive than projected, the finished product might not work at all; or it may be impossible to implement as intended. This could result in budgetary difficulties, irritation from policy makers, and embarrassing media coverage. A perceived wastefulness with tax-payers money is not lightly forgiven, and may prevent progressive procurements in the near future.

In order to minimise the effects of these hindrances, it is important that management and procurers review the procedures timely, and inform policy makers and possibly the public in a pro-active manner of delays or technical difficulties. The public may react more lightly when it is informed about hampering technical difficulties. Failures need equally to be addressed correctly: they should not be taken by policy makers as a reason to blame the procuring service. Failures due to lacking technical options can be the result of procuring innovative products or procedures, and this should be communicated to the public and the organisations alike. Also, technical failures may be limited from the beginning, if an impact assessment is made prior to the procurement procedure.

Internal users

The internal users are important to the success of a procurement of innovation procedure in several ways. Their input regarding the necessary characteristics of the new product or solution is usually considerable, as they can help specifying exact needs for the developers. Also, they are in a position to discover new product or solution needs. An authority does well to ensure that it is

³ It may be more economic in a multimillion Euro procurement procedure to include an impact assessment. This could be outsourced to adequate scientific or commercial entities. The knowledge obtained from such a prior assessment could be systematically collected and used for further procurement procedures.

easy for internal users to bring such perceived needs or even solutions to the attention of management. Structures for capturing the flow of ideas from internal users are needed.

Internal users are also fundamentally important to the ultimate success of a procured innovation in the implementation phase. The introduction of new solutions into organisations generally requires additional changes to activities and culture. Renewal processes of this kind demand major resources of decisiveness and creativity, but are necessary if an innovation is to deliver benefits to organisations.

It is important that users within the public authority receive adequate training to use the innovation. Also, changes in how the work is organised and carried out need to be implemented among the users. Overall, the rationale for the changes must be understood, so that the organisation can embrace a new manner of functioning. Such organisational challenges can sometime require more time and resources than the actual development of the technical innovation.

Procurers: contracting authority employees that procure products

The reasoning and acting of procurers in contracting authorities are influenced by the incentive structures provided by the organisation. If procurers do not participate in the authority's strategic discussions, the incentives for procuring innovative products are weak for the individual procurer. They need mandates to procure innovative products, since these are typified by a high level of uncertainty and risk. If the procurement fails, there must be a shared responsibility.

Public procurement processes today are dominated to a large extent by proficiency in formal procedures and in the regulatory system for procurements. The level of innovation and renewal at public authorities is likely to be strongly restricted by the strong emphasis on formal procedures in combination with a generally weak strategic focus on the procurements. The result is that the nature of public procurements is often defensive.

The status of those heading procurement procedures must be raised. It would be valuable if the role of the procurement officials were expanded to include strategic renewal issues and making "good business", including preparing business models e.g. for risk sharing or the ownership of intellectual property rights. This may require that public procurers are given possibilities to expand their expertise to encompass the new role.

It is also important that the procurers are entrusted with the responsibility to construct and perform procurement procedures that encourage innovation even when procuring already existing products. Time, resources and tools for such innovative procurements are equally important to "pure" procurements of innovation.

Recommendations

If a public authority wishes that its public procurement procedures encourage innovation, rather than hindering it, it is important that procurement becomes a strategic issue. Standard procurement procedures should be constructed so that suppliers are able to offer new products, and procurement of innovation should be looked into, to see if it can play a part in the authority's activities in the future.

Public authority managers should

8 → *Explore methods to install an innovative culture in public procuring organisations, for example by using key performance indicators to create a field of tension between actual performance and desired performance: the tension may stimulate the use of procurement of innovation in order to bridge the performance gap.*

9 → *Consider, when trying to determine the needs of the public authority in the future, a) if there is a need for new products that does not exist today; b) what the long-term costs and benefits would be, depending on whether an innovation or an existing product was bought; and c) how to acquire needed innovative products.*

R

R 10 → *Improve the status of procurers and expand their expertise area within strategy and making business models (regulatory proficiency is not enough).*

11 → *Give procurers responsibility, time and tools to construct/ use innovative procurement procedures that encourage innovations when procuring standard products.*

12 → *Work towards cooperating with other public authorities by establishing and/ or participating in knowledgeable and committed buyer's groups to a) use long-sighted approach to future needs, including thorough pre-analyses, and b) pool demand for products.*

13 → *For important procurements request/ perform an impact assessment of the procured product prior to the procurement and review the procurement procedure afterwards to evaluate its effects (both what was procured, and the process used).*

14 → *Proactively inform policy makers and possibly the public about the status of its procurements.*

15 → *Allow ample time and resources when implementing a technical innovation into an organisation, since its use generally requires changes to organisation activities and culture.*

How to go about procuring innovation will be dealt with in chapter three. Major recommendations to procurers will be already given here: *Contracting authority procurers should (among other things):*

16 → *Make wider use of outcome-based specifications.*

17 → *Explore innovative methods of preparing procurement procedures that makes the public authority market more attractive for innovative companies (for example forward commitment procurement and other methods: examining where and how to express them throughout a public procurement of innovation process from preparation phase to contract).*

18 → *If possible, keep a balance of economists and engineers within the procurement team to ensure quick information and work flows.*

End-users: the public

The public plays an indirect role: their demands and needs in the long run should be assessed, for example via foresight processes, and form the base for visions of our future society. The visions must be broken down into strategies and actions (master plans), where one tool in implementing them is public procurement of innovation.

The public, as end-user of the services produced by public authorities, however is not only important in the long run. If they are dissatisfied by a service or find out that procurement has failed, costing large amounts of tax-payer's money, they will make their voice heard. There are many media stories on procurement about such failures. Thus, the risk of unwelcomed media attention is added to the financial risks of procurement of innovation. One way of balancing this with a positive incentive of the same type is for example to provide journalists with success stories or to reward awards for best public procurement of an innovation.

Suggestions

The manual is not directed toward end-users, but policy makers and public authority managers should, in relation to the public:

19 → *Assess the long-term needs of the public and transform them into master plans or similar.*

20 → *Consider how to provide the public with positive views of public procurement of innovation.*

Sector differences

The procurement process differs considerably from one type of public sector authority to another, as well as across sectors. For example if the structure of administration within a certain public sector is spread over a

2.2.3

2.2.4

large number of entities, without a central agency with a dominant role, there is no single unit of sufficient volume to assume any major responsibility for development and innovation in the sector. In such cases, the scope for bearing the costs and risks associated with developing and testing new and innovative solutions is limited.

The situation is different for public authorities that play a dominant role in their sector. Public authorities and other procuring entities that are large customers in a market have their own interests in driving product development and supporting innovations. Typical examples are power network agencies, which develop power distribution innovations and products since they are responsible for operation and maintenance of the high-voltage grid. Other common examples include road and rail administrations.

There are also differences in the procurement regulations, depending on the sector involved. The so called utilities sector operates under a slightly different set of procurement directives.

As a result of sector differences, the use of different tools and methods in innovation-promoting procurement vary from one authority to another. Different types of control signals for different authorities are needed. Today, certain public authorities already work under governmental appropriation directions and ordinances that require them to engage in some form of innovation-promoting activity. One example is the Swedish Energy Agency. The Agency's ordinance on market introductions and technology procurement requires it to provide specific support for catalytic technology procurement, as well as support for environmental technology and the introduction of new technology into the market. This method could be expanded into other sectors, giving appropriate public authorities for promoting innovation in their field.

Suggestions

If procurement of innovation is to play a role in generating economic growth, it is vital for both policy makers and procurers to consider sector differences.

Policy makers and contracting authority procurers should

21 → *Remember the sector differences when constructing a set of actions to promote public procurement of innovation.*

22 → *Look into assigning development or innovations responsibility to public expert organisations in important public areas (such as energy, environment and health care), with a view to promote technical development and faster market introduction of new solutions in the area, and use public procurement of innovation as one possible method to do so.*

R

18

Public procurement of innovation at different levels of the supply side

2.3

Policy makers

For long-term sustainable economic growth to occur, it is vital that the industry is in a state of continuous renewal and innovation. One thing that can encourage renewal is public demand of innovative products and solutions. It is the role of policy makers to create such a demand by facilitating procurements of innovation among public authorities. However, policy makers can also direct activities to the supply side, addressing the potential producers.

2.3.1

Even though public procurement of innovation is primarily a demand side instrument, it will benefit by being supported by methods directed at potential suppliers as well.

Suggestions

If policy makers want to promote long-term sustainable economic growth by encouraging industrial renewal through public procurement procedures, it might pay to look into activities directed to potential suppliers.

Policy makers should

- R** 23 → *Examine public procurement regulations and processes to ascertain that no system problems exist that indirectly discourage innovative companies.*
- 24 → *Create support functions for companies on how to go about participating in public procurements.*
- 25 → *Develop models and create opportunities for public-private partnerships.*

2.3.2 Potential suppliers and their stakeholders

In commercial markets, established business activities are constantly renewed by being transformed or replaced by others. This takes place mainly via competition between different enterprises, but also via competition between different business operations within enterprises. Some enterprises become established and grow while others shrink or are driven out of business. Companies that succeed in the continuous development of innovative products that the market needs with production costs that allow profit, will have a good chance for long-term survival. A company that is not innovative will soon lag behind competitors that provide the market with more attractive products.

Providing innovations to the public sector can be one way of achieving the necessary renewal in a company and so achieve a high return of investment, and ensure the long-term development of the company. Innovation consists of the development and commercial exploitation of previously non-existent goods and services or new production and distribution processes. Innovation research indicates that the interaction between customers/ users and suppliers/ producers is very often the single most important factor to both volume and success of innovation processes. From the suppliers' point of view, the *existence of an initial buyer is critical* to the development of an innovation.⁴ At the same time, the possibility for finding more buyers after the initial launch is also an important incentive for enterprises to carry out the necessary research and development work.

In many sectors, the needs and demand from public authorities form an important market for enterprises. In certain sectors, public customers even dominate total demand. Thus, there are strong economic incentives for suppliers to try to win public procurement contracts. There are however downsides when competing for these contracts.

Developing an innovation is almost always a high risk project, regardless of whether the customer is a public authority or a private firm. However, in a public procurement, the risk can be even higher. First, public authorities cannot enter into relationships with suppliers in the same way as private enterprises do. Close relationships which involve a lot of communication about the innovation process and the innovative product, are not allowed in the initial steps of the procedure due to competition reasons, under the regulatory systems governing the activities of public authorities. This is especially true of relationships comprising the procurement of goods and services, which are encompassed by the procurement directives. This is a hindrance for companies not to engage in public procurements. And second, there is also the uncertainty created by the possibility of law processes challenging a win of a contract.

Stakeholder and management level

There are several reasons for the stakeholders, that is the owners and stockholders, to encourage, and for the management, to engage in public procurement of innovation.⁵ If an innovative product directed to certain public sectors is a success, the remunerations can be very high. Also, *the size of the potential market* can be appealing.

There are however hindrances that could discourage managers from participating in public procurement. One is the risk factor. It might mean high costs for a company if a product is delayed or if the project goes over budget or altogether fails. In such a case, this might also result in unpleasant media coverage. One way of handling this is to make use of a structured risk management system to assess the potential risk in a public procurement procedure.

⁴ Von Hippel (1988), The sources of innovation och Sörlin och Törnqvist (2000), Kunskap för välförstånd - Universiteten och omvandlingen av Sverige. (Knowledge for prosperity – the universities and the transformation of Sweden.)

⁵ It can be of interest to note that even though stock holders and owners have the same goal, a high return on investment, they can differ in relation to innovation and its accompanying risk. Companies owned by an individual or a family might be more risk taking than a publicly traded stock company, as privately owned companies do not have to report at the end of the year to stock holders.

Another problem encountered by some companies is the difficulty of *protecting their innovations / IPR*. Negative experiences of firms that have offered sub-tenders or innovative proposals to a procuring authority, only to see them offered to competitors or included in procurement documents can lead to refusing to participate in a public procurement bid. Development of a methodology and/ or a survey of legal protection possibilities to prevent innovations from becoming known to competitors would be an important incentive to enterprises.

Suppliers of new products must normally introduce process and organisational changes to be able to efficiently produce the new goods or services. Managers must plan for such changes, both in activities and in company culture, in a way similar to the managers of the public authority.

R&D and sales department level

In the context of public procurement of innovation the research and development department of a potential supplier is to develop new products or solutions at a cost that will ensure some profit to the company. The research and development department must balance the profit demands of the management with the functionality demands of the customers.

The role of the sales department is to fulfil sales targets and to prepare the company's bids to develop new products or solutions. This can be complicated. Bids must be made in compliance to public procurement directives, which can be administratively hard (especially for smaller companies). The bid cannot reveal too much information of the innovative component, but must on the other hand make clear that the proposed innovative product or solution will work.

The incentive structure of both the research and development as well as the sales department consists of management orders, organisational rules and culture and individual career issues and visions.

Suggestions

If a company wishes to explore the potentially lucrative field of public procurement, it needs to be sure of what exactly it is that distinguishes a public authority as a customer from private sector customers, which advantages can be offered and how to avoid potential traps.

Potential suppliers should

26 ↳ *Ascertain that they have a sufficiently advanced risk management system in place, in order to take informed decisions about whether to enter into a public procurement or not.*

27 ↳ *Look over its intellectual property rights management in the context of a public procurement, to be aware of the extent to which its IPR will be protected.*

28 ↳ *Evaluate different business models that might be used in a public procurement.*

29 ↳ *Plan for the fact that producing an innovation will probably bring about the need for organisational and cultural changes.*

30 ↳ *Develop a structure to be able to identify best practice cases in procurement of innovation.*

As the public sector is a large client, it can influence the supply side. Public procurement can thus be used as a policy instrument to stimulate innovation processes. It can be used as an instrument looking at the innovators (firms) as well as innovations (goods, services, procedures). And furthermore, various policy-making bodies and levels with differing intentions can look into the possibilities of public procurement. This will be explored in the following chapter.

R

3. Public Procurement: an Instrument for Policy Makers?

Although innovation policy makers and innovation policy theory will be the starting point for this chapter, it should be emphasised that this chapter is not only relevant for innovation policy makers. It is also important for policy makers who work in sector oriented public departments, where innovations are considered important for realising specific policy objectives in their domain. This chapter aims at explaining how public procurement can become part of existing policy making.

The first part of this chapter provides some background; it discusses the different rationales for engaging in public procurement and explains the role of public procurement in the ‘policy mix’ available to policy makers. Conclusions are presented on the opportunities of public procurement as an instrument for policy makers.

The second part of this chapter presents developments in public procurement of innovation in six countries. These are analysed along a set of dimensions based on questions like ‘What strategies on public procurement of innovation are in place?’, and ‘What rationales are used?’. The chapter finishes with combining theory and practice and some recommendations for policy makers.

3.1 Rationales for stimulating innovation by public procurement

Before explaining the possibilities of public procurement for policy makers an important question has to be answered: **Which reasons do policy makers use to legitimise their intervention in the private sector through public procurement?** These reasons are called ‘policy rationales’. Policy rationales are basically the argumentation

on why public intervention in the private sector is considered needed. By developing policy on public procurement of innovation, policy makers try to influence the private market (suppliers). In this section we will explain which arguments are used within several policy domains to justify these interventions.

The rationales for intervening in public procurement stem from more than one policy domain, making the mix of rationales involved quite complex:

↳ *There is an intrinsic interest in public procurement from the government as provider of services and products such as infrastructure, public information, defence and so on. From this perspective of procurement policy, the provision of better (or in the medium term more efficient) public services is a driver for engaging into procurement of innovative technologies.*

↳ *The domain of economic and industrial policy aims at economic growth and the support of certain strategic sectors. In this domain the trigger of ‘sophisticated markets’ (including the lead market discussion) is one of the pillars behind an interest for using demand led technology policies.*

↳ *Thirdly there is the domain of science, technology and innovation policy (STI), which has as a major objective to stimulate public and private investment in research and technology.*

↳ *Finally, there are a number of specific policy domains (e.g. health, environment) that are in need of solutions to societal problems that potentially could be provided by technology and innovation.*

A debate about rationales for policy intervention is most explicit in the second and third categories. Here the question arises: To which degree is it legitimate for governments to intervene in the economy for the support of innovation?

3.1.1 Economic and industrial policy rationales

Economic and industrial policy rationales lead to the use of public procurement for strengthening local industry, creating attractive markets or support of SMEs. Whereas the goal of securing economic growth and jobs is universal in all countries and underpins the EU Lisbon goals, competition policy sets the boundaries for state intervention in the private sector.

The rationale to *create an attractive market for existing and new firms* – from the local industry base as well as from abroad – is often heard. Edler and Georghiou (2007)⁶ describe this as the rationale of public procurement to support local demand (creating a lead market), which constitutes a major factor in the location decisions of companies and in the inclination to generate innovations in a given location. It relates to Michael Porter's (1990)⁷ cornerstone of the competitiveness diamond: 'conditions of domestic demand', where the role of sophisticated buyers is an important factor for firms to try out new things in that market.

The rationale to *increase the dynamics of the economic fabric and to ensure future growth and employment capacities of SMEs or New Technology Based Firms* (NTBFs) is a second one that is often heard. SMEs often lack the financial means to venture into new technology avenues. Also, a single SME does not have a high probability to create a new market with an innovative product.

Procurement processes can here be designed as a policy instrument for the strengthening of SMEs. The Netherlands SBIR (see excursus at the end of this chapter.) is an example of this. The early stages in the procurement process can be designed in order to address them, to encourage and enforce their participation and provide initial funding up to the demonstration level. This provides the SME with financial means for the development of a new product, and even if the product is not finally selected for further development, the SME has gained a comparative advantage to the rest of the (non-funded) market, and it may use this advantage for venturing into new avenues.

This argument is often lined with the notion that the valorisation of public research could underpin the emergence of NTBFs and spin-off companies. The US SBIR programme strongly builds on these rationales: support new growth firms originating from people and organisations that have had public funding for research. In this way public procurement is a means to improve the transfer of public funding results to the market.

Difficult to justify but yet another target of policies are individual industries. The aim is either to create industries, or to support industrial champions. The proclaimed rationales are often "to be independent of foreign technology" or "to maintain national competences". In these times of globalisation, the 'national' approach often associated with industrial policy can be linked to the declining influence of policy makers over economic actors and their location behaviour. Very often it is not the technological impact at the core of the argument, but employment figures. The procurement of technologies can possibly be a subtle instrument for

⁶ Edler, J., Georghiou, L., 2007. Public procurement and innovation – Resurrecting the demand side, *Research Policy* 36.

⁷ Porter, M.E. (1990, 1998) "The Competitive Advantage of Nations", Free Press, New York.

supporting industries. However, here the focus is on innovation, which can lead to support employment but employment is not the main aim.

3.1.2 Science, Technology and Innovation (STI) policy rationales

Science and technology policy moves on the edges of what is considered to be the private sector and therefore not the domain of direct intervention. Whereas the support for R&D in the public sector uses various rationales, specifically where governments support research and technology in the private sector, there is more to debate on how this can be justified.

Rationales to support investments in STI mostly originate from perceived market and system failures that hamper development, market entry and diffusion of new products or services. Bottlenecks often heard from are information asymmetries (e.g. producers do not know user-preferences, users are not aware of innovations), the lack of interaction between users and producers, the lack of capabilities and willingness to use new technologies (switching costs), high entry costs, technological path dependencies, and lack of awareness and articulation under consumers and policy makers. Public action can help to overcome these bottlenecks and support market introduction and diffusion, which justifies state intervention in more than just basic science.

3.1.3 Domain specific or sector specific rationales

A third category that should be mentioned is the rationales originating from specific policy domains. Energy and information and communication technologies (ICT) are domains that have picked up the opportunities of public procurement. Domain specific challenges that originate from political ambitions are often the main driver for seeking new policy options. The rationales behind these ambitions are widely accepted societal challenges, which the government has the responsibility to act on. Examples are realising a sustainable energy supply, climate change, accommodating the elderly, prevention of diseases, drinking water supplies, etc. Since these societal challenges are often backed by political ambitions, new policy to address these challenges is less debated on.

Conflicting rationales

The above has shown that engaging in public procurement to stimulate innovation is quite complex since there are many policy rationales to take into account. Too often rationales remain implicit; they are not communicated in a clear way. One of the dangers of not making rationales explicit is the fact that some of the before mentioned rationales can be conflicting. Since different policy makers have different reasons for engaging in public procurement as a policy instrument, the only way to find out whether there might be conflicts of interest is by articulating rationales.

The most important conflict of rationales may occur between the economic & industrial policy rationales and procurement policy rationales. While the industry policy has a very strong country focus, procurement policy has a more cross-border approach.

In recent years the interest in public procurement as a policy instrument to increase private R&D efforts has grown considerably (STI rationales). Also, stimulating local market development is getting increased attention (Economic & Industrial policy). While public procurement may have a significant role to play, procurements originating from the public sector have to comply with the relevant EU directives. The directives provide the principles for the procurement process (non-discrimination, transparency, etc.) and as such, calls have to be published European-wide. They are open to all European legal entities and even those beyond Europe. This legal obligation may imply that the return on these investments will not necessarily benefit the national level only (e.g., locally based companies). When engaging in public procurement of innovative technologies, with the purpose of increasing national or local competitiveness, policy makers may consider the opening up to an EU wide market as a threat.

On the other hand, opening up for innovative solutions originating from other European countries, may increase the level of innovativeness of the solutions provided. This means better, more efficient and less costly solutions in the long run, which is always a leading incentive when spending public money.

3.1.4

Basically there are three scenarios when governments engage in a large procurement:

1 → *There are national companies that can perform the service.*

2 → *There are only a few companies who could join but the service cannot be performed without international firms.*

3 → *National companies cannot perform the service.*

S 1. → *If the policy makers want to make sure that national companies perform the service there are ways to increase their chances. For example, the language in which the terms of references are published limits very often the access to documents. What are the benefits? First, the public money spent on the procurement, remains basically within the country, companies obtain external funding, have additional revenue and may have increased their technological stock of knowledge. The funding arrives at specific companies and is not spread evenly (only those companies involved in the procedure benefited). Furthermore, employment was at least supported indirectly. At technological level, public procurement can also serve those existing industries to venture into new lead markets; however, it remains unclear if foreign companies would have provided the service faster and/or cheaper. Obviously, there can be conflicting rationales, here, creating a (national) lead market or buying an (internationally conceived) innovation at the best cost/value ratio.*

S 2. → *The second option is perhaps more interesting, but also complex: if there are a small number of companies which have some technological competences but certainly not enough to perform the service, an international consortium seems a better option. International companies make use of the know-how about local factors, while the national companies realise in particular technological spill-over and learning. While the latter may have been the junior partner in this international consortium, the knowledge spill-over may be*

the basis for own technological avenues, competences and new employment opportunities and the turn form a junior partner to a main competitor on equal basis. The public authorities may have obtained a superior innovation and possibly cheaper, which could not have been realised by the national firms alone. Furthermore, the knowledge spill-over the companies have realised and the learning occurred, have come for free. The benefits for opening the competition internationally are clear: an innovative solution at a good price/value ratio and international knowledge-transfer and learning.

S 3. → *Even the third scenario should be considered as a policy instrument: if it is clear that no national know-how exists, the public authority buying the innovation obtains in general the intellectual property. In order to licence it, it may link a license to the obligation to include a national company – thus even if this national firm was not included in the innovation process, it will become partner in a licensed cooperative agreement. Another consequence may be the creation of a lead market; the purchased technology may stimulate local industry by engaging in maintenance or other support of the new technology.*

Whether these conflicting interests of 'stimulating national/local economic competitiveness' and 'procuring the best solutions, wherever these originate from' will be a problem when procuring innovative technologies will have to be seen in the future.

Another conflict that may arise is between STI-driven rationales and the rationales of the government as provider of public goods and services. Spending (public) money on innovative solutions implies taking risk. A technology may turn out not to work as expected and may lead to unexpected increase of costs. Here the question arises whether the government as a provider of public goods and spender of public money should take the increased risk related to buying innovative products and services. Shouldn't the government wait for the market to develop and implement new technologies and only these when they are 'proven'?

3.2 Public procurement as part of the innovation policy mix

Innovation policy makers can choose from a range of policy instruments to foster certain developments. Traditionally subsidies, loans and fiscal measures have been the instruments that are most widely adopted to stimulate R&D in knowledge institutes and business. These innovation policy measures directly provide means to perform R&D activities and therefore they focus at the supply side.

However, within an innovation system, not only the generation of innovations is important, but also the absorptive capacity of the society - the users of these new technologies. This implies that there is also a demand side that policy makers could or perhaps even should take into account when developing measures to foster R&D activities and increase economic competitiveness. Public procurement can be considered as an option or instrument within this demand based innovation policy.

This section explains the role of public procurement in relation to other innovation policy measures. Recent innovation policy theory is briefly presented and the main challenges for public procurement to become part of innovation policy are discussed.

3.2.1 Demand based innovation policy and the need for a coordinated approach

Recent publications address new possibilities of expanding innovation policy to support market introduction and diffusion. Edler (2008) defines demand-based innovation policy (DBIP) as

“Policy to induce innovation and/or speed up the diffusion of innovation through increasing the demand for innovation and/or define new functional requirements for products and services.”

Edler and Georghiou (2007) distinguish four categories of demand-based measures:

- ↳ *Systemic policies: cluster and supply chain policies.*
- ↳ *Regulation. This category includes norms or standards for product information or for performance of products and services.*
- ↳ *Public demand / procurement: General public procurement where the state acts as a lead user of innovations.*
- ↳ *Support of private demand. Examples of measures in this category are demand subsidies, tax incentives, awareness and training, but also cooperative and catalytic procurement.*

Adding these demand based innovation policy measures to the existing package of supply side policy measures leads to a spectrum of innovation policy measures shown in figure 2. This spectrum of measures could be considered a **‘toolbox’** for policy makers.

Now policy makers may ask: “when should I use which instrument?” This is not a question that can easily be answered. What measure or combination of measures is most appropriate depends on many factors; available knowledge, state of the technology, presence of a private market, available budgets, existing instruments, legislative frameworks etc. There is no simple answer to this question and this chapter does not aim to instruct policy makers on when to use which instrument. Instead, the main objective is to make policy makers aware of this spectrum of available instruments and of the fact that the impact of their policy depends on the careful use of (combinations of) instruments.

Policy makers should embrace a more coordinated approach. Starting from the identification of a ‘problem’, ‘need’ or ‘challenge’ (e.g. rationale energy use, improved health care facilities, e-services), it is obvious that the actors involved are both the suppliers of the innovation (companies and knowledge institutes) and the end-

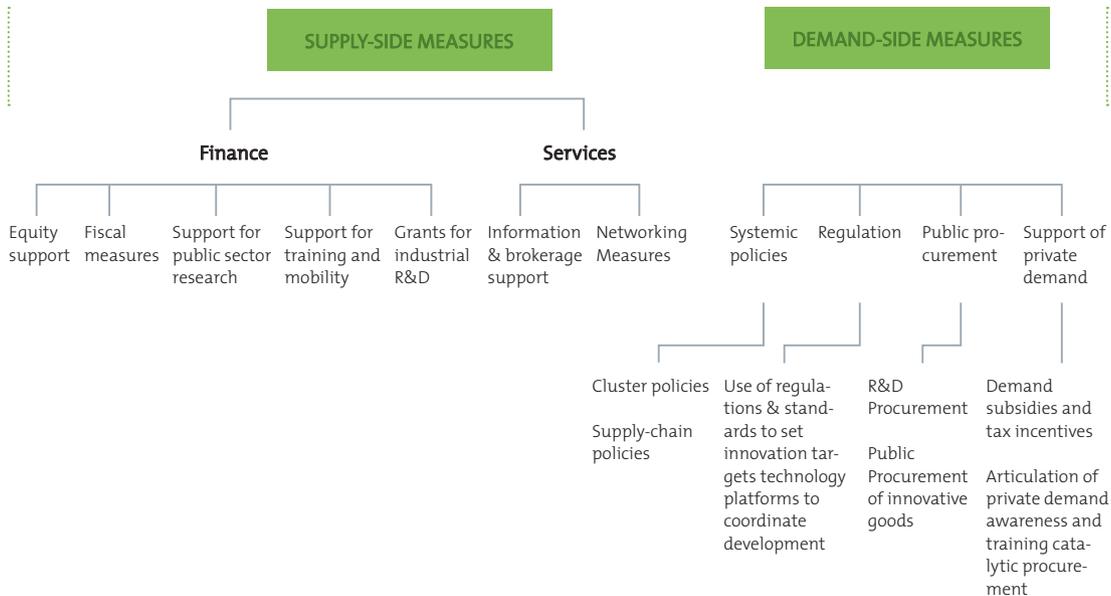


Figure 3
Spectrum of innovation policy measures (Source: J. Edler, L. Georghiou, 2007).
Public procurement and innovation – Resurrecting the demand side. *Research Policy* 36

users (demand). **An integral approach would aim at complementary policy initiatives**, for example a combination of separate demand-side measures and/or combinations of supply- and demand-side measures. Depending on the degree of available technology and demand articulation, policy makers could develop a mix of demand and supply side measures that allow not only development of new technologies but also speeds up absorption by society.

Such a coordinated policy approach also implies including different policy domains: the development of a new electronic card for a car sharing system seems to be directly related to ICT companies as developers. But this example touches a number of various areas like car security, personal data protection, mobility, impact on public transport, environmental issues etc. Every so often, innovation policy makers implement a scheme without a ‘strategy’ or without awareness of initiatives by other departments. Therefore coordinated actions

like the German High-tech Strategy or the UK Technology Strategy Board are good examples of how policy makers can improve their policy making.

Developing a strategy that integrates various instruments and actors is a major challenge, but integrating specifically demand based innovation policy (DBIP) instruments implies additional challenges:

- The development and implementation of a coordinated policy mix including DBIP, faces the need to develop **additional strategic intelligence** and a **conceptual knowledge** of demand-based innovation policy.
- Second, a strategic integration of innovation into all public policy domains is needed. Sector policy aims and innovation should be combined. Innovation is often a means to realise other objectives. Policy makers in many administrations and ministries may not be aware of the opportunities of DBIP or of a more

integrated approach, so informing them about this and *policy learning* is an important challenge. Expertise has to be built up within policy-making bodies.

- ↳ Furthermore, the public action needs some kind of *justification*. Are there specific market or innovation system failures that require governmental intervention? An ex-ante impact assessment of the (combination of) measures should be made. Clearly, the latter needs to be in proportion with the intervention and intended effects.
- ↳ The *right mix and timing* of demand side and supply side measures is important. As noted before this depends on many factors. One way of assessing the need for policy measures is by starting from the technology's development phase in the innovation cycle (research phase, prototyping or ready for market introduction). For each phase different challenges can be identified and specific (demand side) policy measures may be appropriate. An important factor to take into account is the extent to which (private) demand is (already) articulated.
- ↳ Another important set of challenges is related to the *coordination* between the different actors involved. In a vertical sense, coordination is necessary between politicians, policy makers, contracting authorities, procurers, and suppliers. Communication should take place both bottom-up and top-down. Horizontally, coordination is necessary between different government departments. RTDI policy, economic policy, sector policy, procurement policy and fiscal policy could all be relevant. A systemic approach would mean more intensive collaboration with colleagues in other government departments.

3.2.2 Challenges for public procurement to become part of innovation policy

Challenges for a coordinated policy approach included demand based innovation policy are mentioned above. Policy makers who want to engage into public procurement as a policy instrument face additional challenges,

related to specific characteristics of the procurement domain.

Looking at those two issues, innovation policy and public procurement do not have much in common; in fact they seem to be two separate worlds with very *different cultures, objectives, and incentives*. From the innovation policy maker's point of view, innovation is always a priority. He is willing to take a risk in order to enhance something new. When engaging into public procurement, an innovation policy maker may not realise that public procurement is not about buying innovation; public procurement is always about purchasing a public service for the best price (best value/price ratio). The procurer will thus look at the technical offer and the price and chose the one with the best price/value ratio. It can be indeed the cheapest offer, but it does not have to be. To a procurer, procuring an innovation – a new product or a process that is not yet available on the market – is a risky endeavour.

Procurers need to become aware and convinced of the opportunities of innovative solutions to contribute to the solutions of long-term societal problems. In the short run these options may be more costly than the best quality/price ratio offered solution, but in the long run they may be more efficient, sustainable and/or cheaper. This would need to allow and invite the procurers to include a long-term financial calculation in their assessment of the quality of the offer. In order to have this awareness of long term impacts implemented widely, *changes in the procurement practice* – of the habits that became the norm – are needed. This includes functional specifications, acceptance of risk, and allowing failures. It implies a different interpretation of public procurement procedures.

Another cultural difference may lie in the fact that the framework within which innovation policy makers and procurers work is quite different. Demand-based innovation policy and specifically public procurement, is bound by more complex legislative frameworks than traditional innovation policy measures. Legal issues and limiting risk are starting points for procurers.

So an important challenge for innovation policy makers is understanding basic differences between the world of innovation policy and the world of procurers. However, this may also be stated the other way around; **public procurement should be accepted as part of the innovation policy makers' domain**. Not only by innovation policy makers themselves, but also by other stakeholders involved such as politicians, procurers, and sector policy makers. Once procurement is accepted as an option within innovation policy, other stakeholders are more likely to cooperate. This is a necessity, since all these stakeholders need to work together to make procurement of innovations happen.

Finally, two additional features are important for the success of procurement of innovation. First, a more open-minded procedure needs **political backing** for getting accepted and eventually becoming more widely used. Second, **direct communication between the government, policy makers, procuring authorities, the producer, and the user** is needed. Industry should become a partner (both at the supply and the demand side). Early in the procurement process it should be clarified who will be the final user and what are his or her needs.

Show high level political commitment: setting long term priorities and discussing why public procurement is a good way to address these priorities can turn it into an accepted policy tool.

3.3 Using different forms of public procurement within innovation policy

The above discussed the challenges of developing a policy mix and integrating public procurement in this mix. Which mix of measures is best depends on many different factors. Public procurement of innovation may not always be an appropriate policy measure. However, once one chooses for procurement of innovation, different forms of public procurement of innovation may be appropriate for different situations. This section will present a brief strategy for policy makers to assess which form of public procurement of innovation could

be used. The starting point chosen here is the stage of development of the technology at hand.

Edler⁸ distinguishes six phases in the innovation cycle:

- ↳ Discovery and exploration: disciplinary and interdisciplinary research investigates the opportunities for new technological principals.
- ↳ Euphoria about the new technological possibilities among the growing community of scientists and applied researchers.
- ↳ Disillusion: several options turn out to be either technologically or economically unfeasible. Therefore, research activity in these areas is reduced or stopped all together.
- ↳ Reorientation: only those actors with the greatest endurance or radical new approaches contribute to the reorientation of the technology's development.
- ↳ Rise: critical industrial breakthroughs. The breakthrough which is the fastest to achieve market acceptance shapes the future handling of the technology.
- ↳ Diffusion: applications expand again because economies of scale result in a price reduction and allow new application areas and low cost markets to be tapped.

One of the factors determining which innovation policy measures are most appropriate is the current phase of development of a certain technology. During the first three phases the focus should be mainly on the more traditional 'supply side measures' (technology push), whereas from stage four onwards demand side measures can be used as well (demand pull). Different forms of public procurement of technology may be appropriate in these different stages.

When a technology is not yet ready for market introduction, the technological options are still rather wide and

⁸ Edler, J., 2008, Presentation Workshop OMC-PTP, 14 April 2008, Bucharest

industry is far from investing heavily in a specific technological path, *pre-commercial procurement* can be considered. This option is useful in phases three and four as mentioned above. In the pre-commercial procurement procedure, R&D is procured possibly up to a prototype, but certainly not a commercial product. Further explanations on this topic will be given in chapter 4.

During phase five, *strategic public procurement* can be considered to help overcome the mismatch between suppliers and buyers of innovative technologies. Strategic procurement occurs when the demand for certain technologies is encouraged in order to stimulate the market. This is usually associated with sector policy. The government can strictly purchase products for public use and thereby create a public market or the government can procure in connection with private users and also encourage the development of a private (lead) market. Two forms of strategic procurement in connection with private users can be distinguished (Edquist and Hommen, 1998); cooperative procurement and catalytic procurement. When government agencies buy together with private procurers and both use the procured technology, it is *cooperative procurement*. When the state is involved in the procurement (for example by setting standards or providing a demand subsidy), but the purchased technology is ultimately for a private end-user, it is considered *catalytic procurement*. Further explanations on this topic will be given in chapter 4.

In phases four and five technical standardisation may be used for procuring technologies.⁹

In phase six the government serves as a normal client who, just like any other customer wants to pay the lowest price possible for a proven technology. This is done by regular public procurement and is not part of innovation policy.

Conclusions on public procurement as an innovation policy instrument

3.4

The previous sections describe the context of public procurement as a policy instrument for (mainly innovation) policy makers. It is good to note that public procurement is not a simple 'instrument' that can easily be used or implemented. Public procurement is a long-time established practice, which has not been part of innovation policy makers' domain for a long time. The main challenge now is to bring two worlds together and find out where synergy can be realised. This means innovation policy makers have to think about alignment with procurement policy and incentives for procurers to buy innovative products.

The following conclusions can be drawn from the previous sections:

- ⇒ Policy makers have different rationales for engaging into public procurement. Rationales may not be compatible and this may lead to conflicts of interest. Therefore it is important to make rationales explicit in a policy debate. In case of conflicting rationales (e.g. nationalism vs. best solutions abroad) priorities have to be set. Political backup is needed for setting priorities and taking action as a result of chosen priorities.
- ⇒ Policy makers should be aware of the spectrum of possible policy measures. Developing a coordinated policy mix that includes demand-based innovation policy (DBIP) measures and which takes contextual determinants into account is a huge challenge. Inter-departmental cooperation and coordination at national level is needed to make a policy mix of measures work.
- ⇒ Public procurement can be considered an instrument within DBIP. Public procurement can be 'used' when industry is not yet willing to invest in a technology (PCP) or to overcome a mismatch between supply and demand (strategic procurement).

⁹ For more information on this topic we refer to STEPPIN, one of the six pan-European networks on standards established under the Europe INNOVA Programme: <http://standards.eu-innova.org/>

⇒ Public procurement cannot simply be ‘used’ to realise policy objectives from other domains: buying goods and services for public use will always remain the main objective of public procurement. This means it is important to recognize and overcome cultural barriers. Procurers need to be aware of opportunities of innovation and be allowed to take risk.

The second part of this chapter describes developments in policy on public procurement of innovation in six European Member States. The final paragraph will analyse what has happened in these six countries in the light of the above.

3.5 Policy on public procurement of innovation in Europe and EU Member States

3.5.1 European Commission: discourse, studies and initiatives

Policy makers have identified public procurement as an interesting opportunity to spur demand and increase innovation capacity for a couple of years now. The main driver for the attention at the EU level was the perceived under-investment in R&D by the private sector. The 2003 European Commission’s Research Investment Plan included public procurement for innovation as an element to contribute to the 3 % Barcelona target. After that the theme was mentioned in the “Kok Report”, reviewing the progress on the Lisbon strategy (Kok et al. 2004), in the mid-term review of the Lisbon strategy (European Commission, 2005) and the Aho Group Report “Creating an Innovative Europe” in 2006 (Aho et al., 2006).

This high-level attention for the topic resulted in various studies by European Commission directorates on the potentials of public procurement. Important reports are Innovation and Public Procurement, Review of Issues at Stake (Edler e.a. December 2005) for DG Enterprise and Public Procurement for Research and Innovation (Wilkinson e.a. September 2005) for DG Research. STI

and economic rationales were the main drivers for the attention of these directorates. A variety of initiatives followed, such as the publication of a “Guide on Dealing with Innovative Solutions in Public Procurement” (2007, PRO INNO Europe), DG Enterprise’s lead market initiative ¹⁰ (2008), and the Europe INNOVA STEPPIN project ¹¹ (2007). DG Research initiated the FP6-financed research project OMC-PTP ¹² (2007) of which this document is a result and has published a communication on pre-commercial procurement (COM2007/799, December 2007). Other European Commission directorates also saw the potential in public procurement. The rationales here were rather domain-specific. DG-INFOS identified huge potentials in several ICT-related innovations. DG-Environment is clearly not focusing on a specific industry sector but with the “Green Procurement” initiative, it aims at reaching all sorts of innovations that can be made more sustainable, energy efficient and less resource intensive. The handbook “Buying Green” on environmental public procurement was published already in 2004.

Related to these European level activities, the attention for the innovative potential of public procurement was picked up by several European Member States. During the past three to four years it has found its way into national political and policy debates. Only recently this has led to some actual public procurement initiatives. The following sections provide an overview of the developments in a selection of EU Member States.

United Kingdom

Pre 2007

The first report that identified demanding customers as a key driver of innovation was the “Innovation Report” ¹³ (December 2003). This report set out the UK’s focus on innovation as core to achieving best value and challenged the government to “think innovation”. An important result from the “Innovation Report” was the production of guidance for procurers by OGC and DTI on “Capturing Innovation” ¹⁴ (2004). This guidance encouraged public sector organisations to be intelligent,

¹⁰ <http://ec.europa.eu/enterprise/leadmarket/leadmarket.htm>

¹¹ <http://standards.eu-innova.org/Pages/Steppin/Default.aspx>

¹² <http://www.omic-ptp.eu/>

2.5.2

¹³ <http://www.berr.gov.uk/files/file12093.pdf>

¹⁴ http://www.ogc.gov.uk/documents/capturing_innovation.pdf

demanding customers open to new ideas. It contained practical advice on dealing with innovative proposals and propositions and offered advice on encouraging suppliers to provide innovative solutions.

DTI's Five Year Programme "Creating wealth from knowledge"¹⁵ (November 2004) further stressed the need for the government to become a more intelligent customer, to improve value for money for the government by building innovation into departments' procurement practices. It committed DTI and OGC to "Establish a new ideas portal – a mechanism for firms, inventors and researchers to submit unsolicited, innovative proposals to the public sector."¹⁶ In the event a government-wide portal was not pursued but instead it was decided that a number of recommended approaches to the seeking and, where appropriate, the procurement of innovative solutions should be developed. The OGC/DIUS guidance, "Finding and Procuring Innovative Solutions"¹⁷, was published in August 2007.

The "Cox Review of Creativity in Business: building on the UK's strengths"¹⁸ (December 2005) set out the steps that the government and the business, broadcasting and education sectors should take to ensure that UK businesses harness the world-class creative talents that the UK possesses. The review included a recommendation on using the power of public procurement to encourage more innovative solutions from suppliers. The UK government established an industry led Environmental Innovations Advisory Group in 2003. This group took forward the ideas set out in "Capturing Innovation" and developed the forward commitment procurement model together with OGC. In 2006 it set about demonstrating the approach.

Recent developments

The recent Science & Innovation White Paper, "Innovation Nation"¹⁹ (March 2008), is an important development in looking at how demand drives innovation. The document highlights the key role that public procurement plays in encouraging the development of new technologies and providing innovative solutions that provide better public services and respond to societal

challenges. An important commitment in the White Paper is for each government department to include an innovation procurement plan as part of their commercial strategy, setting out how the department will embed innovation in its procurement practices and seek to use innovative procurement mechanisms.

A further important development is the publication of Lord Sainsbury's "Review of Government's Science and Innovation Policies"²⁰ (October 2007). This report emphasised the need for a greater coordination across the public and private sectors. Innovation should be made a core part of the mission statement of each governmental department, and embedded in departmental strategic objectives. A leadership role is foreseen for the Technology Strategy Board to create critical mass and coherence. Supply side support for research and innovation will be in place, but also working with government departments to use other levers such as standards, innovative regulation and procurement. Government procurement will be improved by an "outcome-based approach" and new procurement approaches will be introduced to stimulate innovation (for example, forward commitment procurement and competition of ideas).

Another relevant policy development is the review of the Small Business Research Initiative (SBRI). The SBRI is a cross-departmental programme, which primarily intends to stimulate and increase the demand for R&D from high-tech SMEs and to give them the opportunity to gain a first customer for new technologies, supporting development and demonstration. Lord Sainsbury's Report made recommendations for a reformed SBRI model to transform the financing of innovative SMEs. The recommendations were based on the successful US Small Business Innovation Research (SBIR) programme. The reformed SBRI model was piloted during 2008 with full roll-out planned for April 2009. More information on the UK SBRI can be found in the excursus.

In January 2007, the government announced in "Transforming Government Procurement"²¹ a new vision for government procurement (incorporating innovation

¹⁵ <http://www.berr.gov.uk/files/file12618.pdf>

¹⁶ *ibid.*

¹⁷ [http://www.ogc.gov.uk/documents/Finding_and_Procuring_Innovative_Solutions_\(3\).pdf](http://www.ogc.gov.uk/documents/Finding_and_Procuring_Innovative_Solutions_(3).pdf)

¹⁸ http://www.hm-treasury.gov.uk/coxreview_index.htm

¹⁹ http://dius.dialoguebydesign.net/rp/ScienceInnovation_web.pdf

²⁰ http://www.hm-treasury.gov.uk/d/sainsbury_review051007.pdf

²¹ http://www.hm-treasury.gov.uk/d/government_procurement_pu147.pdf

and sustainability) and the regime required to achieve that vision based on a more professional government procurement service, supported by a smaller, higher calibre Office of Government Commerce.

The “Sustainable Procurement Action Plan”²² (March 2007) also identified ways of harnessing public sector purchasing power, such as Forward Commitment Procurement, to make innovative and sustainable solutions more widely available and affordable to others and to deliver a low carbon economy.

The government published “Building a low carbon economy: unlocking innovation and skills”²³ (May 2008) in response to the CEMEP (Commission on Environmental Markets and Economic Performance) report. This sets out how the government will make the UK one of the best locations in the world to develop and introduce low-carbon and resource-efficient products, processes, services and business models. The Commission specifically highlighted forward commitment procurement as an important means of creating demand-pull for environmental innovations.

In 2008 DIUS, charged with scaling up and replicating the forward commitment procurement (FCP) approach, launched a forward commitment procurement capacity building and project support programme through an “Innovation for Sustainability Competition”²⁴. The aim of the competition is to increase awareness and access to FCP as a practical tool to enable procurement of innovative solutions, and support a select number of innovative flagship projects that can be picked up and replicated across the public sector.

The establishment of the Technology Strategy Board²⁵ as an executive Non Departmental Public Body (NDPB) of the Department for Innovation, Universities and Skills on 1 July 2007 is a significant development. The Technology Strategy Board’s role is to stimulate technology-enabled innovation in the areas where there is a clear potential business benefit and which offer the greatest scope for boosting UK growth and productivity. The Technology Strategy Board will invest in new ideas,

build networks, promote knowledge exchange and provide leadership. It will act as a catalyst to stimulate new areas of activity for business and provide a longer-term view of future technology and innovation needs across the UK economy and globally. Its activities include Collaborative R&D, Knowledge Transfer Networks, the Small Business Research Initiative, Innovation Platforms and Knowledge Transfer Partnerships.

In late 2005, the Technology Strategy Board (when still part of the Department of Trade and Industry) announced its first Innovation Platforms. An Innovation Platform focuses on major policy and societal challenges, such as climate change and an ageing population, through understanding how the government plans to use regulation, standards, procurement and fiscal levers to address the challenge. Through the Innovation Platform, the Technology Strategy Board works with the relevant policy makers and procurement experts from the department, with people from business, research, and regional organisations, to help define the scope of the challenge and options for how best to respond. Once the challenge has been identified, appropriate activities are put in place, such as research programmes to stimulate business innovation and to ensure UK businesses are ready with innovative solutions to take advantage of future procurement opportunities issued by the government department.

The NHS National Innovation Centre (NIC)²⁶ is one interface between non-NHS sourced innovations and the marketplace that is the NHS. One criticism that innovators & suppliers have had of that market is that it is not good at indicating to potential suppliers what its problems are and hence what innovations it would like to receive that would help it address those issues. The NIC has worked with several DH & NHS bodies on a programme called “Wouldn’t It Be Good If...?” (WIBGI) which is designed to identify NHS un-met needs (i.e. areas open to technological innovation) and to provide development support for key innovations. In this respect it is therefore similar to Phase 1 of the SBRI programme and the two organisations are in collaborative dialogue.

²² <http://www.defra.gov.uk/sustainable/government/publications/pdf/SustainableProcurementActionPlan.pdf>

²³ <http://www.defra.gov.uk/environment/business/commission/pdf/cemep-response.pdf> 32

²⁴ http://www.dius.gov.uk/policy/public_procurement.html

²⁵ <http://www.innovateuk.org/>

²⁶ <http://www.nic.nhs.uk/Pages/Home.aspx>

Conclusions on the UK

In its work over recent years, the UK government has developed a policy on innovation in public procurement seeing it as one of number of policy goals that can be delivered through procurement. The policy states:

“The Government’s policy on innovation in public sector procurement is to encourage and embed innovation, where it will help deliver higher quality public services at good value for money and in a way that is consistent with the UK regulations, EU Procurement Directives and EU Treaty obligations. In particular the government’s harnessing of innovation in public procurement must not discriminate against suppliers in other member states.”²⁷

STI rationales, economic rationales and sustainability rationales are all present in the debate and initiatives in the UK. The UK seems to have gone through a twofold exercise: first, the UK has gone through a bottom-up exercise to spot good innovative procurement practices (OGC/DIUS guidance, Finding and Procuring Innovative Solutions, August 2007), some of which have been picked up by government departments. For example, the Department of Health and Department for Business Enterprise and Regulatory Reform adopted the forward commitment procurement model to source smart, ultra efficient lighting for the NHS. Second, public procurement for innovation has been positioned as a new policy instrument in a strategic approach. This has resulted in procurement of innovation being picked up by the Technology Strategy Board as a strategic instrument that is part of the integrated approach set out in the Innovation Platforms.

3.5.3 Sweden

National policy making in Sweden

Developing a national policy in Sweden is quite difficult since local authorities and county councils are very independent. This is, to some extent, and at least in practice, also the case for governmental agencies. For about fifteen years, they have full budget responsibility and can claim increased costs as a result of imposed policy enforcements. On the one hand, these organisations benefit from this because they have a lot of

freedom in the planning of their operations. On the other hand, it leads to a decentralised budgeting process, which makes it hard to govern these organisations and to develop and to implement a coordinated policy.

However, one way of getting the procurement of innovation topic on the agenda of public organisations is by starting with more innovation-oriented organisations. Today, the appropriation directions²⁸ for a few Swedish public authorities state that they shall perform activities that stimulate innovation within their field. One example is The Swedish Energy Agency. Among other things, it facilitates market introductions of new energy and environmental friendly technologies by providing support for technology procurements.

Despite the fact that national policy development is difficult, the political interest in using public procurement as a demand instrument to stimulate innovations is rising. Especially the Ministry of Enterprise, Energy and Communications is interested, but also to some extent the Ministry of Finance, being responsible for public procurement.

Developments in Sweden

The Swedish Government’s strategy “Innovative Sweden – a Strategy for Growth through Renewal” first mentioned the use of public procurement to stimulate innovation in 2004. Although public procurement was included in this strategy document it has not lead to development of national policy yet.

In May 2006, the Swedish Government requested an investigation of how public procurement can stimulate innovation, including technological development and business opportunities. The assignment was given to the Swedish Agency for Economic and regional Growth (NUTEK) and the Swedish Governmental Agency for Innovation Systems (VINNOVA). They were asked to collaborate with the National Board for Public Procurement (NOU). The organisations found that despite the lack of a national policy for stimulating innovation through public procurement, some public actors were already using forms of innovation procurement, such as

²⁷ www.ogc.gov.uk/documents/Innovation.pdf

²⁸ This is a government directive putting an appropriation at the disposal of the spending authority and specifying the allocation

infrastructure actors like the Swedish Road Administration (Vägverket) and Swedish Rail (Banverket).

VINNOVA's report "Public Procurement as a Driver for Innovation and Change"²⁹ (2007) can be considered the first real strategic document on the issue in Sweden. It was in fact a proposal to the government on public procurement of innovation. The main message was that stimulation of innovation in public procurement processes must become a strategic issue for all Swedish public agencies. It was recommended to introduce public innovation procurement (defined as procurement that includes R&D) as a general method of procurement in Sweden. This requires clear incentives and supporting structures. Suggestions for incentives were a) stating that 1% of the total volume of procurements should be allocated to innovation procurements and b) highlight successful procurements and reward them. In terms of supporting structures; public R&D agencies with R&D-review as a core business could assist procuring agencies to assess innovative potential. Furthermore the report recommended simplifying the procurement process requirements and coordination of demand (however, considering the innovation potential of SMEs). A final recommendation was to create a reliable information source on public procurements to evaluate the scope of procurements and innovation capacity.

Recently (October 2008), the government presented its "Research and Innovation Government Bill". VINNOVA had proposed a specific chapter on public innovation procurement for this bill. Although the presented bill does not include the full proposal by VINNOVA, it does address opportunities of public procurement.

First, it mentions the general potential of public procurement to increase innovation activity in both public organisations and companies (section 8.6). Development of methods and competence regarding the design of procurement processes is emphasised. In light of this need, VINNOVA will conduct a number of pilot projects to demonstrate different variants of innovation promoting procurement.

Second, the opportunity of SBIR-like initiatives to support the development of new knowledge intensive enterprises is described (section 8.6.1). The Swedish government intends to further investigate the prerequisites for such programmes for societal sectors where public actors have a responsibility, like infrastructure, energy, health care and medical service. This part of the bill even states that one percent of the appropriation to central government authorities should be used for innovation contributions aiming at developing new knowledge intense enterprises. If the parliament agrees on the Bill, it can be considered the first policy document on public procurement to stimulate innovation.

VINNOVA's commitment to promoting public procurement for innovation has led to the setup of a pilot programme at VINNOVA in 2008 (also referred to in the Research and Innovation Bill). The programme aims at setting up five pilot projects on public innovation procurement. In these projects a variety of methods, criteria and pre-requisites will be studied. The pilots will include innovation-promoting procurement (R&D is optional), procurement of innovation (R&D is a prerequisite) and innovative procurement methods. The public innovation procurement pilots will be organised around specific (procuring) actors from different sectors. The areas chosen for setting up pilots are environment technology, environmental criteria, e-health, lead market initiative areas and standard products (incremental, substitution). Also different strategies will be explored: bundling of demand, having one big buyer cooperating with smaller buyers, and Coordinated Framework Agreements. Issues like IPR, risk management, SMEs, state aid, trust and confidence will be addressed in all pilots. VINNOVA will try to involve all levels of stakeholders at various stages of the process and system, in order to ascertain a sustainable system.

Conclusions on Sweden

The policy presented in the "Research and Innovation Government Bill" is mainly based on STI and industry rationales. This leads to the built-in conflict, since the public procurement regime is set to increase the cross-border trade within EU, and the innovation initiatives

²⁹ <http://www.vinnova.se/upload/EPIStorePDF/vp-07-03.pdf>

are normally derived from an interest in fostering national or regional supplier markets.

Another conflict exists within the public procurement regime; so far there is no coordination of the legal framework, value for money driver and political/societal goals. Procuring actors have to take into account a variety of social, political and practical aspects and there is yet no framework that helps them to prioritise.

Although national policy making in Sweden is rather complex, the recently presented “Research and Innovation Government Bill” may be the start of national policy development. Once approved by the parliament, the bill may lead to the development of a coordinated national strategy on public procurement of innovation. In this national policy, rationales have to be made explicit and priorities need to be set. This implies interest and backup from both political and non-political decision makers.

The pilot programme initiative from VINNOVA may play an important role as a way to learn and get all required stakeholders involved. The pilot initiative will build on the incentive of Swedish public authorities to perform activities that stimulate innovation within their field.

3.5.4 The Netherlands

Since 1999 it has been the explicit policy of the Dutch government to be a professional buyer, by which is meant that the procurement process should be innovative (a challenging demand and new forms of contract); a European buyer (better complying with EU-rules) and an electronic buyer (using ICT for more transparency). Apart from that, first steps towards green procurement were set.

The attention for professional procurement has been growing and asks for changes in approach and organisation of procuring organisations. To inform government procurers of these developments in their sector, PIANOo ³⁰, the Netherlands knowledge network for government procurers, was initiated in 2005 as an answer to the parliamentary inquiry into buildings frauds in

the Netherlands. This network creates connections between public procurers to exchange best practices and knowledge. In order to do this PIANOo organises meetings and seminars (including the annual congress, with around 600 government procurers) and virtual instruments (including a discussion forum with over 2700 participants). It has recently set up a European discussion forum for public procurement practitioners (around 130 members). PIANOo is also involved in several international developments, such as the International Public Procurement Conference (IPPC) and several European Commission initiatives, such as STEPPIN. Specific attention for procurement of innovative solutions started in 2004 with the growing awareness that public procurement of innovative products and services could contribute to the solution of important societal problems and innovation policy objectives. Public procurement and innovation was mentioned in the plans of the Cabinet in different ways (Coalition Agreement, February 2007):

- ⇒ The Government will promote innovative entrepreneurship, being a large buyer.
- ⇒ The Cabinet will harmonise and simplify procurement rules (a new public procurement law).
- ⇒ Publication of tenders should be centralized at one internet site (TenderNed).
- ⇒ Firms that present innovative solutions will be in good books (Launching Customer).
- ⇒ The government stimulates innovations by giving R&D-commitments to SMEs (Small Business Innovation Research).
- ⇒ In recent years several parallel procurement initiatives were started in the Netherlands. All of them include a role for innovation, although its extent differs.

The ministry of Economic Affairs initiated a Small Business Innovation Research (SBIR) pilot in 2004. The most important objective to start this pilot was to give SMEs

³⁰ <http://www.piano.nl>

the opportunity to come up with innovative solutions for major societal problems (formulated by the ministry) and helping them to bring these solutions to the market on a contractual basis. The programme was inspired by the US SBIR programme in which governments spent a set percentage of their annual R&D budgets in innovative SMEs. More information on the Netherlands SBIR can be found in appendix A1. Another parallel initiative was the announcement in 2006 by the central government of the ambition to consider green alternatives at 100% of procurement decisions in 2010. Green procurement³¹ is being facilitated by SenterNovem. In cooperation with producers SenterNovem has developed characteristics of sustainable (and often innovative) alternatives for procurers.

The Launching Customer programme started in 2006, initiated by the Ministry of Economic Affairs. Two government roles were foreseen related to procurement of innovations. First, it was found that the government could act as a first customer for innovative products and services (being a lead-buyer). Second, the government could play an important role in creating a market for innovative products or services (being a launching customer, creating a lead market). Activities within the Launching Customer programme were aimed at creating awareness and informing policy makers and government buyers; nowadays activities are focused on:

Combining category management and procuring innovation: In 2007 a Chief Procurement Officer (CPO) was appointed by the minister of Economic Affairs to coordinate procurements of several national departments (ministries). The main incentive for setting up this office was that horizontal coordination and cooperation between departments is very difficult. Advantages of interdepartmental procurement are financial (less but larger procurements: scale) and may lead to new lines of thinking, enabling procurement of innovation.

In 2007 a new interdepartmental group Knowledge and Innovation was installed. This group develops innovation programmes for specific policy domains in need of innovative solutions (safety, water, health, energy,

health foods, sustainable agriculture and bio-diversity). This group considers demand-based innovation policy instruments (e.g. SBIR, procurement of innovation, Lead Markets Initiative, pre-commercial procurement) as an option within these programmes.

At the end of 2008 the Parliament challenged government to be an innovative buyer in 2009 (10 cases), to procure innovation (10 cases) and to formulate SMART goals for these actions in the 2010 budget.

Conclusions on the Netherlands

The above initiatives in the Netherlands were initiated separately. The Cabinet plans from 2007 did not result in policy making in terms of the development of a strategy integrating the separate initiatives. One explanation may be that different actors with different rationales are responsible for the initiatives. STI rationales and rationales from specific policy fields led to the initiation of the interdepartmental group Knowledge and Innovation. SBIR is mainly driven by economic and industrial policy rationales, although STI and rationales from other policy fields play a role as well. The Green Procurement initiative is derived from sustainability rationales. Economic rationales led to the Launching Customer initiative and may also have contributed to the installation of a Chief Procurement Officer. Rationales from within the procurement domain (government as a provider of goods and services) have contributed to the PIANOo initiative and the Chief Procurement Officer.

Although these rationales are not explicitly formulated, most of the rationales seem to be in place in the Netherlands system. However, economic and industry rationales seem to dominate the debate and the initiatives that are set up, which may not lead to finding and procuring the most innovative solutions. A next step would be the development of a national strategy on public procurement of innovation by the government, integrating the existing initiatives. To realise such a strategy it would be necessary to make rationales explicit in a policy debate and prioritise them. This implies the involvement of politicians in the debate, to make choices at national level.

³¹ <http://www.senternovem.nl/duurzaaminkopen/index.asp.uk/files/file12618.pdf>

3.5.5 Belgium (Flanders)

Political commitment for public technology procurement is found in the “Flemish Coalition Agreement 2004-2009”, which states that public procurement will be used to stimulate the innovation potential of industry. The “Flemish Innovation Policy Plan 2005-2010” defines nine routes for an integrated innovation approach, of which route five is to set an example as an innovating government. This means integration of innovation horizontally in government policy and organisations, using standards and norms for setting the initial impetus for the development of new generations of products, foreseeing possibilities for supporting development of new services/products in public procurement, special attention for seven domains.³²

However, up to two years ago, Flanders was not actively developing a policy on public procurement of innovation until the Flemish innovation agency IWT picked up the theme from European Commission initiatives and saw opportunities as a result of the above political documents. With the consent of the Flemish government IWT started to explore public technology procurement as a new demand-driven tool to stimulate innovation. The topic was therefore explicitly embedded in innovation policy and considered as an alternative instrument to the more traditional subsidy instruments. The main objective was to generate a methodology, which could be used and implemented throughout all government departments.

IWT chose to explore procurement of innovation as a new innovation policy instrument within a thematic working group of the Innovation Platform on Environmental issues and Energy³³ (MIP) (2006-2007). This resulted in a Flemish manual on procurement of innovation (Feb 2008, under translation) and a proposal to the Flemish Government for a pilot scheme on pre-commercial procurement in 2008-2009 (10-15 million EUR) within the MIP.

Below the Flemish model for procurement of innovation is presented. The model consists of an integrated procurement process covering the complete path starting from the political ambitions to the final commercial

procurement. The Flemish model is built up around two essential building blocks: the master plan and the innovation platform.

The master plan starts from an analysis of the actual situation with regard to a socio-economic problem or a public service that has to be improved or newly developed. Additionally an estimate on the future socio-economic evolution in society is given including the citizens’ expectations on solutions for the socio-economic challenges and the public service level. Based on this vision a desired future outcome is expressed. Subsequently the opportunities for innovation are explored by detecting the limits of the actual solutions when extrapolating/stretching these in order to try to achieve the desired outcome. The master plan should be concise and preferably not too technical in nature.

The master plan forms the input for the innovation platform. The innovation platform brings representatives from all stakeholders together to further develop the master plan and technically translate it. Contracting authorities, research institutes, enterprises and industry sector organisations will constitute the platform. The Flemish Innovation Agency (IWT) will act as a facilitator with an innovation policy interest. The innovation platform decides which mix of policy instruments is most desirable to achieve the outcome foreseen in the master plan. It also evaluates the opportunities of innovation procurement. The innovation platform in the Flemish model is headed by the contracting authority, which means that the procurement dimension is dominating. The innovation platform will position innovation procurement in the innovation cycle and define what form of procurement should be chosen (commercial or pre-commercial). However, other stakeholders can further explore the opportunities offered by the other instruments available from the policy mix and launch complementary initiatives (e.g. launching basic research initiatives at research institutes, launch industry R&D with or without grants, propose tax measures, etc.). Although the model is primarily designed for innovation procurement purposes it may have a wider functionality and pay-off with regard to innovation.

³² These seven domains are infrastructure, energy, culture, health, environment, mobility and welfare.

³³ The Innovation Platform on Environmental issues and Energy (MIP) was created in 2006 in order to stimulate innovation in the Flemish environmental/energy sector. MIP was setup as collaboration between energy, environment and innovation, bringing together industry, government, universities and research institutes. Within MIP both supply-side measures and demand-side measures are considered (regulation, public procurement).

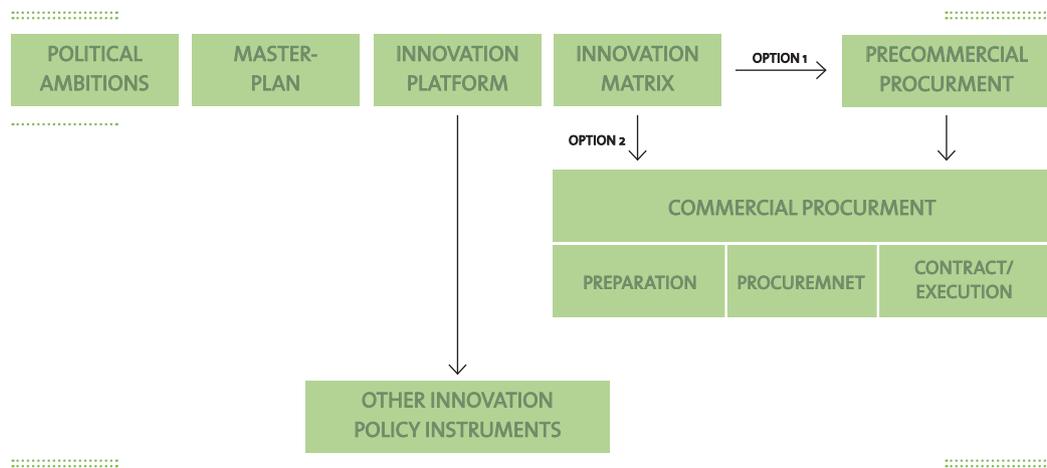


Figure 4
The Flemish model for innovation procurement

The pilot scheme on innovation procurement that has been approved by the Flemish Government in July 2008 will be the first implementation of this model: the pilot scheme has been introduced to all interested stakeholders in September 2008, followed by a positive response from all governmental departments. At the beginning of 2009 procurement projects were defined. MIP is the innovation platform for exploring the opportunities of a systematic approach on public innovation procurement in the domain of energy and the environment. 10 million EUR funding has been raised for the pilot in the innovation department and 5 million EUR will be added by procuring departments. A permanent cell 'Innovation Procurement' within IWT and training of procurers in a master class will be in place to support the pilot. In case the pilot proves successful full rollout is foreseen for 2010-2014.

Conclusions on Flanders

In Flanders there is a debate going on in terms of horizontal innovation policy, cutting across policy domains. Innovation should be part of all policy domains and not just the innovation/industry policy domain. The Flemish Innovation Policy plan 2005-2010 emphasises that innovation as a scope for policymaking should be fully integrated in all policy domains of the Flemish government.

At the moment rationales on procurement of innovation originate from innovation policy and to a lesser extent from specific (sector) policy domains.

Main conclusions are that in Flanders public innovation procurement has become part of the national innovation policy strategy, although it has not been implemented yet. The details of the innovation procurement process and of the building blocks need to be further worked out in the planned pilot programme. The value and composition of a balanced policy mix comprising procurement of innovation still needs to be unravelled: it is felt that the innovation platform plays a key role in this regard.

Germany

Current Situation

Germany has seen several initiatives as regards to public procurement of innovation during the last years. Among others two major publications have been primarily recognised.

One is the Fraunhofer study for the European Commission on public procurement, led by Jakob Edler, which refers to public procurement as an innovation policy

instrument or mechanism that acts as a tool for developing new technologies and raising investment in innovation and research (2005).³⁴ This study mentions all major documents concerning public procurement in Germany at that date and discusses the relevance of the MEAT³⁵ criteria in public purchasing in Germany.

Comparably, the Ministry of Economics at that time published the results of a working group within the German government initiative “Partners for Innovation”, led by Rainer Jäkel and Knut Blind, which promotes a new approach of innovation policy that is to say a significantly improved one with more intensive coordination of public funding and public demand in order to leverage promising technologies, also including the enhancement of public procurement processes.³⁶

In 2006 the Federal Ministry of Economics and Technology (BMWi) together with the German Association Materials, Management Purchasing and Logistics (BME) published a brochure dealing with new impulses for the procurement of innovation in order to open up a fruitful discussion on this topic.³⁷ This brochure gives recommendations on how public procurement can be designed in order to be more innovative during the procurement process and to spur innovative solutions. It refers to the EU directives and procurement law and provides guidance for procuring authorities. Best practice examples are presented in this brochure to underline these recommendations.

Furthermore, Germany has put special emphasis on public procurement as regards to sustainability (www.beschaffung-info.de), e.g. “buying green”. The annex of this brochure shows the example of “Particle Filters in Public Railcars”.

German public authorities have developed several platforms for electronic procurement which facilitates the processes of public purchasing. One centralised platform that serves at national and at federal level is “E-Vergabe” (English: Electronic Procurement) (www.evergabe-online.de).

One prominent example of the public sector’s technology needs is the toll collection system for freight vehicles using the German highways which includes new technologies, e.g. Global Positioning System, GPS. This system is the only complex toll billing system worldwide that operates without affecting the flow of traffic.

In 2006 the German government has set up a national strategy for its innovation policy involving all national ministries in the process. The major aim is to “...turn Germany into the most research-friendly nation in the world.”³⁸ In order to foster innovation at all levels the German government has been and is still releasing 15 billion EUR for programmes fostering new technologies. This includes an increase of the investment in research and development as intended by the Lisbon strategy and the definition of major innovation policy priorities.

The strategy is called High-Tech Strategy and has the following priorities: developing lead markets, improving the cooperation between science and industry, accelerating direct application of research findings including major fields of interest such as health, security, energy, optical technologies, information and communication as well as nano-technology. Each of these fields has received a clear timetable of what to achieve between 2006 and 2009. Furthermore each area will be explored by a strength-weakness analysis. The particularity about the High-Tech Strategy is that it includes the support of all ministries of the German government with the overall aim for Germany to become a leading nation in all high-tech related fields. All research and development activities will be directed and tuned to reach this goal. This strategy puts innovation policy as one of the major rationales of government activities.

Furthermore – and this is especially interesting for public procurement of innovation – the High-Tech Strategy aims at making public authorities more responsible for the dissemination and also application of new technologies. Therefore, also the public procurement system is seen necessary to be reorganised, even more since every year the German public authorities award contracts of

³⁴ Edler et al.: Innovation and Public Procurement: Reviews of Issues at Stake. Fraunhofer Study, 2005.

³⁵ MEAT – Most Economically Advantageous Tender.

³⁶ Jäkel, R. / Blind, K.: Innovationsfaktor Staat – Aktiver Promoter und intelligenter Rahmensetzer. Stuttgart, 2005.

³⁷ Bundesministerium für Wirtschaft und Technologie (BMWi) + Universität der Bundeswehr + Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.: Impulse für Innovationen im öffentlichen Beschaffungswesen. Berlin, 2006.

³⁸ The High-Tech Strategy for Germany published by the Federal Ministry of Education and Research, Berlin, 2006.

about 260 billion EUR (12 % of Germany's gross domestic product). The public procurement system is planned to be modernised in order to make it more suitable to the introduction of new products and technologies during procurement activities.

As part of a coordinated innovation policy the German government will improve public procurement for the dissemination of new technologies. This includes the development of an enhanced information infrastructure in the public procurement system to enable agencies to seek early information about the latest technical developments on the market. Further training concerning procurement-related issues, such as determining requirements, invitations to tender, assessment concepts and implementation procedures to procurement that targets innovation (integrated procurement management) is planned. Six ministries have agreed upon increased joint efforts concerning an innovation-oriented public procurement. These ministries are: Ministry of Economics and Technology; Ministry of the Interior; Ministry of Defense; Ministry of Transport, Building and Urban Affairs; Ministry for the Environment, Nature Conservation and Nuclear Safety; Ministry of Education and Research. All administrative agencies and procurement offices at federal, state and municipal level must take part in the strategic task of fostering innovation through public procurement. External experts should evaluate government procurement offices to ensure they meet the standards as regards to economical efficiency and user-friendliness.

As a special "treat" the German government has created the Government Contractor Innovation Achievement Award (awarded at the "Day of the Public Procurers"). This award is given once a year to the most innovative product that was purchased through public procurement and the most innovative public procurement process initiated by the Federal Ministry of Economics and Technology.

Conclusions on Germany

The High-Tech Strategy includes stakeholders at all levels: decision makers, politicians, industry and research. Public procurement of innovation is therefore incorporated in a comprehensive policy mix that includes all areas of innovation. The process of conducting the High-Tech Strategy is supervised by the industry science research alliance of the Federal Ministry of Education and Research that report annually. Bringing all this together, it can be called an all-embracing strategy, or a political vehicle that involves stakeholders at all levels. However, as regards to concrete activities concerning innovation-oriented public procurement within the High-Tech Strategy no major scheme has started yet. A next step for Germany could be a pilot project showing that through public procurement the government can act as an intelligent buyer. It could represent public authorities as being a role model when it comes to demanding innovation.

In terms of rationales, the High-Tech Strategy is mainly driven by economic and industry rationales. However, the High-Tech Strategy also fosters innovation and the solution of major societal challenges.

France

History

Created in 1989, the Richelieu Committee is a lobby group of innovative SMEs whose goal is to facilitate the linkage between SMEs and world market leaders. In order to reach this goal, they have designed several programmes among which the SME pact ³⁹ (2006). This programme is focused on increasing the amount of large companies' procurement from innovative SME, by organising technology brokerage events, an online web matching tool, an annual observatory of best procurers. Among the 50 players who have signed up for the programme, there are many CAC-40 French companies, but also several key public players; four ministries (including the Ministry of Industry, SME procurement ratio = 19 %), the Ile-de-France public hospitals network of procurers (SME procurement ratio = 10 %), some key

³⁹ <http://www.smepact.eu>

public research organisations (including Atomic Energy Center, SME procurement ratio = 25 %), public companies (like French Post, SME procurement ratio = 33 %), and even municipalities such as the Paris City Office. In the absence of a Small Business Act, joining this SME pact was, for the French public players wanting to further explore public procurement of innovations from SME, the closest one could get on a volunteer basis.

At the end of 2007, L. Stoléru, a former socialist Minister, presented to President Sarkozy his report on public procurement and SMEs in which 15 key measures were proposed. First of all, he suggested to forget about the quota obsession that drives most Small Business Act advocates who think we should copy-paste the American Small Business Act model: according to his figures, French SMEs already collect about one third (in value) of all public procurement. The report insists more on other measures that could be taken, like negotiating with WTO an increase of the amount above which formal procurement is mandatory. In L. Stoléru's view, designing a "European Small Business Act" should consist in grouping together several measures and tools to stimulate SMEs, rather than just one compulsory quota for SME procurement. Other ideas proposed in the report are: reserving up to 15 % of high-tech and innovative procurements to SMEs that invest 10 % in R&D, changes in the public procurement law (excluding for example the public hospitals), creating a unique web portal for all regions and the central government, making allotment more systematic. He also proposed to create a new guarantee fund that would limit financial risk of procurer in case of failure of the SMEs. Another set of propositions concerns payments: reducing payment delays to 30 days, doubling upfront advance payments, subscription by public procurers of reverse factoring contracts to ease SME payments, etc. Finally, L. Stoléru imagines a system in which the largest public French procurers could mentor and coach 3 or 4 innovative SMEs per year, accompanying them to international markets. In a nutshell, Stoléru's report shows how the Small Business Act success in the US is more due to the administrative structures than the existence of an act. France should create a new "France SME" network in all its

regions, together with OSEO the National Innovation Agency, in order to inform and train SMEs in the fields of national and international public procurements. Things accelerated early 2008 when the French Minister of Industry, Lagarde proposed a blueprint for a new law aiming at modernising the French economy. In July both Parliament Houses passed this project called "Law of Modernisation of the Economy"⁴⁰ (LME). This is a major structural revamping of the French economy. The LME explores 5 fields and contains 173 articles. The current financial crisis, potentially lethal for many SMEs, drove the French government to speed up its introduction. A dedicated web portal was designed to inform about the LME and show the calendar of decrees passed.

Among the 10 most important measures of the LME, we can find the creation of an experimental *French Small Business Act*, directly inspired by one of the propositions found in the Stoléru report. This corresponds to article n°26 in the final text of the law. The article stipulates that public procurers will be able to give preferential treatment for innovative SMEs provided the following conditions are met:

- ↳ The procurer can use this preferential treatment up to 15 % of its annual procurement budget.
- ↳ The bid is smaller than 133.000 EUR.
- ↳ The SME concerned can demonstrate a 10 % R&D effort rate (ratio in terms of staff or budgets involved in R&D).

Public procurers will also be allowed to favour SMEs when their bid is considered equal (i.e. minimal discrepancies amongst several offers). This law offers a 15 % leeway to public procurers who want to try out innovative solutions offered by SMEs, in that respect it is more an encouragement than an obligation. The law will be experimentally tested during a 5-year period.

The Richelieu Committee, in charge of the SME Pact, considers this article of LME as a good first step in the right direction, and they propose to extend it at

⁴⁰ <http://www.modernisation-economie.fr>

European level in 2 areas: raising the maximum bidding amount (currently around 100.000 EUR to make sure this is considered under the “public procurement” limit) and including in the scope of public procurers other public players not currently included (like French Railways, French Post, French Power Company).

Both L. Stoléru and Comité Richelieu deem that albeit “15 % reserved for innovative SMEs” sounds like a quota, it is however a dispensation to the existing rules, an open door to lure public procurers into innovative solutions proposed by SME.

Conclusions on France

Developments on public procurement of innovation in France are solemnly driven by industry rationales, the support of French SMEs. Innovation rationales or sectoral rationales have not been mentioned (although of course increasing the innovation capacity of SMEs is an important objective). An advantage of this single-track approach of innovation procurement is the fact that there are no conflicting rationales that could hamper the start-up of actual initiatives. On the other hand one may ask what the potential impact of the Small Business Act on France’s total innovation system will be, since SMEs still only account for the smaller part (15 %) of public procurement budgets.

3.6 Conclusions and recommendations

3.6.1 Conclusions on policy developments

What can we learn from comparing countries, now that we have described policy developments on public procurement of innovation in several member states? Can we define success factors for establishing a policy on procurement of innovation?

In the UK public procurement is acknowledged as an innovation policy instrument. A strategic approach, coordinated by the Technology Strategy Board, is under development. The Innovation Platforms concept facilitates horizontal coordination between government departments focussed on a specific technological or

societal challenge. At the same time good practices were identified and studied, which led to recommendations for procurement policy makers and procurers.

The recently published Research and Innovation Bill may be the start of national policy development on public procurement of innovation in Sweden. However, a national policy debate seems necessary to address the possibility of conflicting interests. Political priorities have to be set. A pilot programme is being setup by VINNOVA to identify success and fail factors of procurement of innovation in practice. This is done by experimenting with different procurement situations.

In the Netherlands many different stakeholders have identified public procurement as a strategic instrument (at the government level and by various departments). There is no strategy on public procurement of innovation to integrate different policy initiatives. Rationales have to be made explicit in a policy debate, involving politicians so priorities can be set. An interdepartmental SBIR-programme has run for a couple of years now, but so far this has had little spill over effects to contracting authorities.

In Flanders, public procurement is embedded in the new innovation policy strategy. A pilot programme has recently started, initiated by the Flemish Innovation Agency IWT. The programme intends to involve different government departments by having them initiate a call and making means available for organising a procurement of an innovative solution. By realising good-practice examples the programme intends to build knowledge on innovation procurement and inspire contracting agencies.

The High-Tech Strategy in Germany also starts from major technological and societal challenges and operates horizontally, involving all relevant government departments and other stakeholders. Although public procurement of innovation is identified as an important policy instrument, this is not yet translated into a strategy on public procurement.

In France, industry support rationales are the main drivers for SME support initiatives. Public procurement of innovation is considered a possible policy instrument to support these companies. As opposed to the other countries described, the main objective in the policy debate is not to enhance innovativeness in general, but to support SMEs.

We can conclude now that in all described countries public procurement has been identified as a policy instrument to enhance innovation. In all countries it was mentioned in core documents, published by governments. However, development of a policy and first steps towards implementation is only starting to evolve in the UK, the Netherlands and Flanders. In Sweden, Germany and France policy on public procurement of innovation is in an even earlier stage of development.

In the plans of the UK, Germany and – to a lesser extent – Flanders we find explicit attention for horizontal coordination across policy areas. This is done by making public procurement part of an (innovation) policy strategy with attention for the opportunities of demand-based innovation policy (UK Technology Strategy Board, German High-Tech Strategy). Such coordination activities are not seen yet in the Netherlands, France and Sweden. This is possibly related to the fact that economic rationales are the main drivers for the attention for public procurement of innovation. In the Netherlands other rationales are present, but policy has been rather fragmented.

In both the UK and the Netherlands different non-related policy initiatives were initiated, which included attention for changing the practice of procurement professionals (PIANOo in the Netherlands and OGC/DIUS in the UK). All programmes on public procurement of innovation are in the pilot-phase or even before (SBIR-NL, SBRI-UK, the new Flemish and Swedish schemes). The pilots started so far (SBIR-NL, SBRI-UK, the Flemish scheme) have in parallel that innovation policy makers initiate them to research the opportunities of pre-commercial procurement.

Recommendations to (innovation) policy makers

31 → *Decide whether you need innovation procurement.*

Innovation procurement has its (yet underdeveloped) place but it is not the only instrument available to policy makers. Policy makers who face a specific technological or societal challenge should start with an assessment of the technical capacities for innovation. This means identifying what is already there (e.g. through a market inquiry), or to get an overview of technological developments and possibilities – which can be obtained through the technical dialogue. However, if no competences appear to have developed, it may be better to start an R&D programme. Innovation procurement should be used when developments are closer to market entry – and developments may differ between technologies as well as industry sectors.

32 → *Make rationales explicit: determine your scope and ambition.*

Do we want to make public procurement part of innovation policy? OR Do we want public procurers to buy more innovative?

Although this looks like the same question, there is a difference in ambition and resulting complexity.

In the first situation one acknowledges 'Demand-Based Innovation Policy' and includes procurement as a policy instrument in the innovation policy mix. A strategy to implement this is to set up a new scheme or programme, a 'procurement'-scheme, outside the regular procurement frameworks, in which for example the innovativeness of the procured goods and services is a prerequisite. Schemes like SBRI-UK, SBIR-NL and the Flemish one are examples of this. In these situations innovation (in SMEs) is the main objective and the amount of money spent is relatively small.

3.6.2

R

In the second situation the innovation policy maker reaches out to the public procurement domain with the objective to embed 'innovation' in the practice of regular public procurement. As ambitions cover another domain that has so far been outside the scope of innovation policy makers, complexity increases since other rationales enter the picture. This implies that regular public procurement should be 'opened up' to be able to procure innovative solutions. Here the strategy focuses at providing incentives to stimulate contracting authorities to buy different – more innovative – products. This means that the reading and interpretation of the procedures by the procurers needs to be enlarged. In this situation buying a product or service for public use is the main objective for the procuring authority; innovation is a secondary goal and should contribute to the first. Budgets can be much larger.

33 ↳ *Continuously adapt to the given conditions.*

Actors involved need either best practice examples or learn by doing. The learning-by-doing is in fact happening within the pilot projects as mentioned in the country descriptions. Now, while there are only a few pilots aimed at procuring innovation, the descriptions above provide useful ideas for the further development of innovation procurement:

Integration of innovation policy concept in relevant bodies.

As seen in Sweden, several ministries and implementing agencies use innovation procurement even when this was not formally included or a planned strategy. The different institutions behaved in an innovative spirit. Therefore, the approach in Germany of an all encompassing strategy seems to be a means to have the same concept implemented in all relevant ministries – with the advantage that all ministries can apply the concept to their respective areas and with their respective means.

It is in particular important at policy maker level, to develop a ***long-term perspective***, realise political commitment (to be able to set priorities) and develop an

implementation plan. Innovation procurement cannot simply be a top-down policy strategy with a predefined precise procedure. Its implementation needs the involvement of stakeholders like procuring services, suppliers and possibly end-users. It often needs trial-and-error possibilities and adjustments to sector-specific circumstances.

How to inform about best practices when practice in general is low, and information is scarce? One answer may lay in the ***creation of a network***, such as the Dutch PIANOo for public procurers. It brings together all sorts of interested actors, informs about tenders, procedures, provides feedback and serves as a virtual platform. At the moment, information about innovation procurement is spread over a number of websites, academic articles, reports etc. A one-stop site at least by each individual Member State would bring together the current state of play.

As pilots are not in full practice yet, the desperately needed 'convincing examples' will not be available for some time. It is therefore absolutely vital that ***information about the ongoing and planned initiatives*** are monitored in a sense that the individual steps, decisions, and impacts are documented for further use and/or further amendment. This evidence needs to make it to the policy makers, to the trainers and the procuring services.

Good communication. If the procurement of an innovation fails, who will be blamed in public? As policy maker one may think ahead and communicate a pilot as a means for learning with the possible option to achieve an innovation that benefits the public. A failure can be explained but lessons need to be learned and also communicated.

Excursus – SBRI UK and SBIR Netherlands

UK Small Business Research Initiative (SBRI)

Background

Since 2001 the UK government has set targets for each of its larger departments to procure 2.5% of their external research from SMEs (small and medium-sized enterprises) under the Small Business Research Initiative (SBRI). This aspiration was set in the context of the US model in which government procurement of technology research and development plays a very significant role in the innovation economy. The US SBIR (Small Business Innovation Research) programme has been operating since 1982 under federal legislation. The old UK initiative, however, lacked many of the key features of the US initiative; many government departments were easily able to meet the target as a result of existing work, much of it on policy studies, and it had little visible impact on innovation. In March 2008, the policy decision to reform the SBRI was announced, including a pilot programme in 2008 and a full roll-out from April 2009.

The New SBRI

The new programme is being designed with the following features, many of which are akin to the US SBIR programme.

- ↳ Substantial and visible budget.
- ↳ Phased projects of sufficient size to create demonstrators or products on trial, and to make a difference to an individual company.
- ↳ Transparent, systematic programme with impact measurement.
- ↳ Contracts, not grants (100% funded).
- ↳ Driven by a near-to-market innovation need (typically 5 years out).
- ↳ Intellectual property remains with the contractor (with a licence for the department).

Programme Objectives

The SBRI programme in general has two principal objectives in terms of impact, which need to be balanced over the long term. They are highly compatible but neither must dominate to the exclusion of the other.

- ↳ Deliver demonstrated leading-edge technologies to meet the department's future needs ahead of commercial procurement.
- ↳ Provide a demand for R&D services from UK early-stage, high-technology businesses, to support them through a critical stage in their development and thus establish future industry in the UK.
- ↳ Since these will only become apparent in the long term, the programme also needs short term input and process objectives. These include:
 - ↳ An excess of high-quality applications.
 - ↳ Substantial programme budget.
 - ↳ Contracts let in line with the agreed budget.
 - ↳ A substantial share of the contracts going to micro SMEs.

Netherlands Small Business Innovation Research programme (SBIR)

Background of the programme

The Dutch SBIR programme is focussed on innovation by SMEs (although larger companies are officially not excluded). SMEs are creative, flexible, fast and capable of transforming knowledge to an actual product or service. However, these companies are often not considered in public procurements. Through the SBIR programme SMEs get the opportunity to develop innovations on a contractual basis. These innovations contribute to solving specific societal problems (objective 1). At the same time the companies get the chance to develop new and

innovative products, processes and services (objective 2). To increase the chances of commercialisation of the innovations, intellectual property rights stay with the company.

The programme was inspired by the US SBIR programme in which governments spent a set percentage of their annual extramural R&D budgets in innovative SMEs.

The SBIR programme in the Netherlands is initiated by the Ministry of Economic Affairs (EZ), in cooperation with the Ministries of Agriculture, Nature and Food Quality (LNV); Transport, Public Works and Water Management (VenW); Housing, Spatial Planning and the Environment (VROM); Education and Science (OCW); Public Health, Sport (VWS) and Defence.

Setup of the programme

In 2004 the Dutch government (the Ministry of Economic Affairs) started with the first SBIR pilot. In 2006 the Ministries of Defence (Def), Agriculture (LNV), Public Works and Water Management (V&W) also started pilots. For each pilot the responsible ministry formulates a societal problem that needs an innovative solution (e.g. two dike breakthroughs in 2003 and 2004 urged for new dike inspection methods). The ministry makes the SBIR budget available. SenterNovem, an agency of the Ministry of Economic Affairs, implements the programme.

SBIR projects take place in three phases of which the first and second phase are tendered separately by the government.

Feasibility study (max 6 months, budget 20.000 - 50.000 EUR per company): feasibility of development and production, assessment of demand, decide who is needed to realise the innovation, expected societal effects, plans for financing.

Research & Development (max 2 years, budget max 200.000 - 450.000 EUR per company): further development and prototyping and testing to assess whether production is possible and if the product meets demand

(technologically). Only successful companies from phase one can participate in this phase.

Commercialisation of a product or service. Open to all interested parties.

Evaluation of the SBIR pilot

An SBIR pilot started in 2004. A first evaluation in 2007 has shown positive results. All departments have received many and good quality ideas after tendering their problem. On average 16 good proposals were received for phase 1, most of them from SMEs (83%). Many proposals focus on new applications of existing knowledge. In 89 % of the cases SMEs started new cooperations with other SMEs and/or knowledge institutes.

Public procurement

SBIR is a type of pre-commercial procurement, because it aims at financing R&D for innovations, the companies get a contract (100 % financing, no subsidy) and the contracts are awarded in competition. Because it is pre-commercial procurement (R&D) these contracts do not fall under the European procurement directives. However, the tendering procedure still has to be transparent (nation wide publication), objective (clear criteria and procedures) and discrimination on basis of nationality is not allowed (companies from other countries should be able to compete). IPR belongs to the company, but the government can receive royalty free non-exclusive licenses in general interest.

Further information

A short description of the SBIR programme and an overview of the SBIR pilots so far can be found at the SenterNovem website: http://www.senternovem.nl/sbir/sbir_in_the_netherlands.asp

4. Challenges in Designing the Procurement Process

The procurement directives and their translation into national legislation are often perceived as forming an obstacle to procuring innovation. We will show that the procurement directives can be put to work in a way that facilitates the procurement of innovation rather than hampering it.

This chapter focuses on identifying suitable procedures and processes that can be pursued, whilst conforming to the provisions of the EC Treaty ⁴¹ or the procurement directives on the basis of experiences and best practices as well as some conceptual development.

The following procurement procedures will be dealt with in more detail:

- ↳ pre-commercial procurement
- ↳ design contest
- ↳ forward commitment procurement
- ↳ competitive dialogue
- ↳ negotiated procedure with/without publication of a contract notice

Public procurement of innovation is more than just applying a procurement procedure; it is a whole process whereby the procurement procedure is just one building block in the procurement process. Embedding the above mentioned procurement procedures in a process with systemic features facilitates public procurement of innovation. This will bring the demand and the supply side on the same wavelength in their search for change for the better through innovative solutions.

There is a wide variation in procurement situations: there is no single procurement process that fits all

situations. Depending on the type of procurement, a suitable procurement process can be put together comprising the appropriate building blocks, which will be listed in the following pages.

Regular public procurement is quite often kept very simple and launched by choosing a procurement procedure, filling out a contract notice and drawing up a tender document (based on former purchases) without too much preparation. In contrast to regular procurement, public procurement of innovation is a full-fledged process whereby the preparation phase is vital for a successful outcome. Besides being a process public procurement of innovation is a project. Since procurement of innovation is dealing with innovation and in pre-commercial procurement with research and development (R&D), it is advisable to apply good innovation/R&D project management rules: i.e. identify a need and articulate this as an innovation opportunity, gather information and plan, consult with all stakeholders involved, develop a business case and business plan with the necessary budgets, prioritize and take informed decisions whereby risk management ⁴² has a role to play. Clear communication to the outside world is also of vital importance. Procurement contracts should be drawn up with clear rights and obligations of each party involved. When respecting these basics a coherent and efficient procurement process will result.

The following pages present instruments which are available in the three phases of the procurement process. It is the contracting authority's decision, especially when procuring innovation, to select the most appropriate building blocks from the whole toolbox of instruments to build a procurement process that best fits their purpose.

⁴¹ A contracting authority should always be aware of the fact that the principle of equal treatment is of particular importance in the field of public procurement. In the context of public procurement a contracting authority is required to ensure, at each stage of the procedure, equal treatment and, thereby, equality of opportunity for all the tenderers.

⁴² The amount of money exposed to risk should be inversely proportional to the risk; information gathering and time should also be used as parameters to mitigate risk: the earlier a procurement project is started the more time is available for assessment and exploration of an innovative solution to a problem and to lower the risk in the final full-scale procurement.

The *building blocks* can be grouped according to the different procurement phases:

- The preparation phase: this covers the political ambitions, the coalition agreement, policy plans, business case/master plan, market analysis (including patent searches)/foresight exercises, market consultation, innovation platforms.
- The procurement phase: this includes the prior information notice, the contract notice, the choice between different procurement procedures (design contest, negotiated procedure with/without prior publication, competitive dialogue, technical dialogue, procedure based on exception 16f ⁴³ in 2004/18/EC, forward commitment procurement) and the award notice.
- The contracting/execution phase includes price, IPR clauses and value engineering clauses.

4.1 The Preparation Phase

Public procurement of innovation starts from a socio-economic challenge or from a public service or government function that has to be improved in terms of efficiency or functionality. Based on an analysis of the actual situation and a vision on the future (evolutions in society and expectations from citizens), needs can be formulated that result in a desired overall outcome. ⁴⁴ The needs and desired outcomes form the basis of a so-called business case. This business case will always be the standard against which the procuring authority will evaluate the necessity to purchase novel technologies. A business case forms the onset to the master plan. ⁴⁵

The Contracting Authority's long term strategy: the master plan

The master plan is an input provided by the contracting authority. It acts as a guide to help find a way to achieve the desired outcome with regard to a problem starting from the actual situation. A business case can further be developed into a master plan with more detail about the long term strategy and important milestones in order to achieve the final goal starting from the actual situation. It is examined what happens when one tries to achieve the desired outcome by extrapolating the solutions used in the actual situation. This will show the limits of the actual solutions show the gaps between actual solutions and desired outcome and identify the opportunities for innovation. A master plan should list the innovation opportunities and prioritise them. In summary the master plan should brush a broad picture without too much technical detail or preference for technical solutions. This leaves a maximum degree of freedom to explore solutions and to stimulate innovation from the supply side. In the context of a master plan it is worthwhile to identify the drivers for innovation in a public environment. In the private sector companies are directed based on key performance indicators (KPIs). Equally KPIs can be considered in the public sector and in a master plan reference can be made to KPIs. KPIs challenge an organisation to increase performance and functionality. Innovation can be the answer for an organisation to respond to such a challenge. The master plan should encourage suppliers to develop innovative solutions and appeal to their core competencies.

4.1.1

48

⁴³ The procurement directive shall not apply to public service contracts for research and development services other than those where the benefits accrue exclusively to the contracting authority for its use in the conduct of its own affairs, on condition that the service provided is wholly remunerated by the contracting authority.

⁴⁴ An example of a desired outcome is to cut deadly car accidents by 50% between 2001 and 2010 and by another one third by 2015 as for example Belgium has set as a target. The way this can be achieved can be broken down in specified needs in certain areas: need for active and passive cars features, road/building/equipment focusing on safety, speed limits, alcohol limits, technical features required by law such as an alcolock.

⁴⁵ A master plan is here defined as a long-term outline of a project or government function.

R 34 → *Display master plans that are perceived as good practice benchmarks.*

35 → *Develop and make a master plan template available to contracting authorities.*

36 → *Establish a knowledge centre that can assist contracting authorities throughout the whole procurement of innovation process and also provide training on procurement of innovation.*

4.1.2 Market consultation: Structuring the interaction between contracting authority and market

Through market consultation the procuring authority will not only gather sufficient information on the availability of the desired solutions or the capacity to develop one, but as a consequence it will also better understand its own needs and will be able to improve its master plan. The market capabilities can be estimated by surveying the market in a non-interactive way (market analysis) and by entering the market (market consultation).

The question is then how the market analysis and more importantly the interaction with the market needs to be structured.

The market analysis can be performed in different ways:

- by searching the internet for solutions that are commercially available
- identify European projects related to the needs
- visiting exhibitions
- carrying out patent searches to identify suppliers/solutions in an early stage in the innovation cycle
- carry out/buy market studies
- consult with other contracting authorities.

Market consultation can be organised in a consultation platform. In a consultation platform there are basically only two parties: the contracting authority and the supply side (enterprises and industry sector organisations). The consultation can be extended with another

activity, i.e. foresight. Foresight is a mechanism to bring together all interested stakeholders to develop a long-term vision: the aim is to address a challenge with a dynamic strategy in order to succeed in a successful implementation of an action plan and eventually deliver agreed programmes of activities and optimise the benefits for all parties. Consultation and foresight can be combined in one platform, a so called innovation platform. The main objective of the innovation platform is to receive input for deciding whether a pre-commercial or a commercial procurement is required and to what degree other innovation stimulating policy instruments can be used to solve a challenge. In a consultation platform only the procurement interest is dealt with, without attention for other policy instruments that might speed up the availability (R&D subsidies for industry and research institutes, cluster policy) and diffusion (tax instrument, demand subsidies) of innovative solutions. By setting up a platform, a bridge is created between the demand and the supply side, and therefore an opportunity for a structured interaction between the market and the contracting authority.

By setting up a consultation platform, the market actors acquire knowledge about the interests and intentions of a contracting authority. On the other side, the contracting authority acquires the necessary information to evaluate whether there is concurrence between its own needs and the possibility for the market to fulfil these needs. Through its wider strategic scope, the involvement of all relevant stakeholders and the availability of more financial resources, an innovation platform is more suitable to tackle big challenges. The participation in an innovation platform should be open to all market actors who possess the knowledge and skills necessary to discuss innovation at the level required by the contracting authority: in addition to the participants in a consultation platform an innovation platform is extended with universities and research institutes as well as with national/regional innovation agencies ⁴⁶. Theoretically, not only European companies are eligible, but also non-EU economic operators.

⁴⁶ In a consultation/innovation platform the procurement decision is by default an exclusive decision taken by the contracting authority after having considered all the information gathered in the platform.

The UK has gained experience in market consultation. The UK uses market sounding as a market consultation technique which consists in consulting the market via a website through which the demand side can make contact with the supply side. On the website a prospectus can be found describing the challenge as well as a structured response form that allows a supplier to describe how he thinks he can contribute to the solution of a problem. In addition a company contact directory can be created for networking purposes on which a company can give authorisation to be displayed with contact data and area of interest. The market sounding exercise is announced by the use of a Prior Information Notice (PIN) ⁴⁷. Examples of such PINs can be found at TED (see for example zero waste prison mattress system, UK Rotherham Ward Lighting programme; UK-London ID-cards).

Concept viability is another variation on market sounding: this concept consists of checking the “Do-ability” of an idea raised by a contracting authority in an early stage of the procurement planning. The proposal is circulated to a selection of companies that are invited to comment on the feasibility of the proposed concept. Concept viability normally comprises a workshop announced with a PIN.

In order to guarantee transparency and equal treatment of all parties, the contracting authority could entrust the organisation of the market consultation to a neutral party, with experience in this field and whose internal regulations include a commitment to guarantee transparency and equal treatment.

For reasons of comprehensiveness, it has to be specified that the publication of the results of a market consultation do not need to include the choice of the contracting authority for a pre-commercial or commercial procurement procedure. This choice will nevertheless be announced at a later stage by the contracting authority and subsequently published through its own means (e.g. website).

While building consultation/innovation platforms use can be made of existing platforms/clusters for a specific sector to which the innovation belongs and that already exhibit parts of the required functionality. The functionality has to be extended to fulfil the preparation needs of a procurement project. This way, the consultation can be enhanced through an existing broader expertise in the field.

Due to confidentiality concerns enterprises most of the time do not show their real in-house development capabilities, intentions and status of their developments in a workshop. As a consequence a workshop organised for market consultation purposes is quite often a one way communication from the contracting authority to the supply side. This can to some extent be alleviated by allowing one-to-one discussions between a supplier and a contracting authority in the context of a market consultation workshop, whereby confidentiality is guaranteed. The consultation/innovation platform shall in principle fall outside the procurement procedure and therefore outside of the scope of application of the procurement directives.

The setting up of a consultation/innovation platform must not be confused with the technical dialogue as described in principle 8 of the Directive 2004/18/EC ⁴⁸. The technical dialogue can be considered as a specific market consultation form aimed at the definition of technical specifications.

Although both the consultation/innovation platform and the technical dialogue include a degree of interaction with the market actors, a market consultation is not aimed, unlike the technical dialogue, at the tender itself, but at evaluating the existing market for the desired products and services, without searching for a decision on a technical solution.

Sometimes though, it is difficult to distinguish between market research and technical dialogue. As a consequence, it is recommended that the contracting authority always acts in a non-discriminatory and transparent manner, whenever it decides to organise a market research.

⁴⁷ A pre-announcement is usually used in order to shorten the normal deadlines. This is not the objective of the pre-announcement when employed within the framework of innovation, as shortened deadlines in this case could lead to contradictory consequences, namely that market actors would be discouraged to enrol for consultation.

⁴⁸ Before launching a procedure for the award of a contract, contracting authorities may, using a technical dialogue, seek or accept advice which may be used in the preparation of the specifications provided, however, that such advice does not have the effect of precluding competition.

There is a risk that during the process of market consultation different market actors will develop collaborations which breach the European competition rules. These risks for breach of competition rules could be avoided by requesting the participants in a consultation/innovation platform to sign a declaration that they will stay in compliance with the relevant competition rules. Competition rules do however not exclude parties to enter into collaboration or form consortia as a result of networking in the Innovation platforms, in order to group expertise with the aim to develop a solution for a challenge.

The innovation platform has a broader scope than procurement of innovation: it could also come to the conclusion that accompanying innovation stimulating measures could benefit the procurement of innovation project and the stakeholders involved (especially the supply side). It may well be that a procurement of innovation project lacks core competencies in the region, while the project is of critical importance to the region. In such a case it might be desirable to build a technology development capacity in the region for these critical application areas. This means that industry and research institutes have to be stimulated to invest in the necessary capabilities to tackle such important challenges. In this regard innovation agencies, research councils and regional development agencies can take the necessary innovation stimulating actions and free up the accompanying financial resources. The innovation platform can also give advice on other accompanying demand-side measures to stimulate diffusion of innovation such as tax measures and demand subsidies. Carrying out the market consultation in an innovation platform rather than in a consultation platform leads to a more coherent approach since this is a better guarantee for a systemic approach since different innovation policy instruments can be aligned to achieve the best outcome.

The Procurement Phase (with special focus on pre-commercial procurement) 4.2

The procurement phase starts with the sending of the contract notice to the Office of Official Publications of the European Communities (OPOCE) in Luxemburg for publication in the Official Journal OJEC and ends with the sending of the award notice to OPOCE. For tenders below the threshold the publication has to be made at national level. The procurement phase covers the actual procurement procedure. This includes sending of the contract notices and contract documents, receiving the expressions of interest or the bids from the market, organising an eventual pre-bid conference, evaluating the expressions of interest or the bids and finally awarding the contract. In the following special attention will be given to challenges in pre-commercial procurement.

Commercial Procurement

For innovative products/services in the *diffusion* phase and available in commercial quantities the standard procurement procedures apply: most suitable for procurement of innovation are all procedures whereby MEAT (Most Economically Advantageous Tender) is used as the guiding principle.

Procurement of innovation can be facilitated by *innovative procurement*. Probably the biggest effect of innovative procurement is to be expected in the diffusion phase. Simple, but well thought-out, innovative procurement can be very powerful to help contracting authorities (varying from central governmental to very local) embrace innovation in the diffusion phase. Guidelines have to be developed how to use innovative procurement with focus on diffusion of innovation. Most probably diffusion of innovation can already be achieved in simple ways by using some basics in the contract notice to encourage the supply side to offer innovative solutions: e.g. use of appropriate language such as the request for an “innovative solution”⁴⁹, the use of outcome-based specifications, to name just a few. In the contract notice the CA can also request a working prototype as a prerequisite award criterion or make a pilot phase part of the procurement. This helps to build

⁴⁹ In the development phase the request for an innovative solution can also be linked to the R&D CPV-classification 73000000 as is done in for example the 2009/039386 contract notice recently published by OVAM (BE) that raised a request for the tender document that was about 5 times higher than in similar cases without that combination.

a bridge of confidence between the supply and the demand side facilitating diffusion of innovation.

In case the innovation is in the *adaptive or integration* phase, it depends on the balance between R&D and engineering necessary to develop a marketable product or service, whether the standard procurement procedures have to be followed or not. If the work consists mainly of engineering rather than of R&D the procurement project can normally also be handled with the regular procurement procedures. The process can be accompanied by a technical dialogue foreseen in the European Procurement Directives (2004/18).

For *procurement of innovative products/services in the exploratory phase not subject to the exception of art 16(f)*, the following procedures in the procurement directives seem most appropriate:

- ↳ The competitive dialogue
- ↳ The negotiated procedure with prior publication of a contract notice under the following conditions:
 - ↳ In exceptional cases, when the nature of the works, supplies, or services or the risks attached thereto do not permit prior overall pricing;
 - ↳ In the case of intellectual services, insofar as the nature of the services to be provided is such that contract specifications cannot be established with sufficient precision to permit the award of the contract by following open or restricted procedures;
 - ↳ In respect of public works contracts which are performed solely for purposes of research, testing or development and not with the aim of ensuring profitability or recovering research and development costs.
- ↳ The negotiated procedure without publication of a contract notice under the following conditions:
 - ↳ For prototypes manufactured purely for the purpose of research, experimentation, study or development; this provision does not extend to quantity production to establish commercial viability or to recover research and development costs;

- ↳ For public service contracts, when the contract concerned follows a design contest and must, under the applicable rules, be awarded to the successful candidate or to one of the successful candidates, in the latter case, all successful candidates must be invited to participate in the negotiations
- ↳ Below the applicable thresholds and in cases where the 20 % rule can be applied as explained in art.5 of directive 2004/18/EC.

↳ The Design Contest

The special case of pre-commercial procurement

The procurement situation becomes interesting when the market cannot offer a solution for a problem and a large R&D effort remains to be performed by the supply side. The situation becomes even more complex when the contracting authority has no clear idea about functionality and required performance of the solution: at best they can describe the desired outcome or effect of the innovation, which is a more general requirement level than functionality/ performance. In such a case the contracting authority cannot enter into a regular procurement exercise, but has to spur the supply side to enter into an R&D phase. The contracting authority can do this in different ways depending on how competitive the supply side is and how eager the demand side is to have access to a solution for a problem. If the supply side is very competitive it can be sufficient for the contracting authority to communicate its need for innovation to the market. If the market opportunity is big enough the supply side will start an R&D effort for which it can apply for R&D subsidies. After some time the contracting authority can test the market again and enter into a regular procurement exercise comprising, if required, the acquisition/testing of prototypes and a technical dialogue to set (functionality/performance) specifications.

Pre-commercial procurement can be regarded as the purchase by the government of R&D options⁵⁰. An R&D effort creates an option for the supply side to generate

4.2.1

⁵⁰ D. Connell: „Secrets“ of the world's largest seed capital fund: How the United States uses its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to support Small Technology Firms, p. 36 (2006).

cash flows from future business. As such this option has a value for the supply side: in case the potential offered by B2G business case is limited the option has low value for the supply side and the B2G case will be low on the priority list in the company's R&D portfolio. From the perspective of the demand side considerations in terms of taking a stake that creates an option can be made that gives the contracting authority at some point in the future access to a solution for a particular problem. This option has a value too, which is the more important the higher the expected benefits are and the higher the potential benefits are (uncertain pay-offs). A contracting authority can create such an option by buying R&D services: by doing so the contracting authority actively maximises its access to future innovative solutions. When the supply side is highly competitive with regard to the requested solution the demand side option has little value and buying R&D services is sub-optimal: in such a case it is better to inform the market on its procurement intentions and rely on competitive forces to get access to an innovative solution. In case the R&D (service) has both a value for the supply as well as for the demand side a situation is created whereby there is room for risk-benefit sharing. This leads to a situation as described under the exception of art. 16f of 2004/18/EC and is the basis for pre-commercial procurement. Pre-commercial procurement will normally be organised in a way different from a regular procurement. The underlying reason is that in pre-commercial procurement there is still a technology risk due to the development effort required before an innovation can be made commercially available. This also implies that pre-commercial procurement includes the need for a strong interaction between the demand and the supply side, this interaction seems stronger than is needed within the standard commercial procurement procedures. The main characteristic of innovation/technology is the potential it creates to improve operations and productivity and the functionality it offers to solve problems that are out of reach of existing traditional technology. Against the upside potential there is a downside risk for technical failure when spending money in developing (supply side) and acquiring (demand side) innovative products/services.

In what follows special attention will be given to the procurement of R&D services subject to the exception of art 16(f) of directive 2004/18/EC, denoted as pre-commercial procurement. This approach will be compared to other procurement procedures that are being promoted for the procurement of innovation involving R&D and that are subject to directive 2004/18/EC, i.e. the competitive dialogue, the design contest and forward commitment procurement.

In December 2007, the Commission issued its pioneering communication on pre-commercial procurement. The concept of pre-commercial procurement is based upon the experiences within the United States, amongst others on the SBIR-programme, but structured within the context of the European legislative package.

SEC (2007) 1668 describes Pre-commercial procurement as follows:

“Pre-commercial procurement consists of a procurement of R&D services that involves risk-benefit sharing at market conditions and in which a number of companies develop in competition new solutions for mid- to long-term public sector needs. The needs are so technologically demanding and in advance of what the market can offer that either no commercially stable solution exists yet, or existing solutions exhibit shortcomings which require new R&D. By allocating R&D benefits and risks between public purchasers and companies in such a way as to encourage wide commercialisation and take-up of R&D results, more beneficial time to market conditions are created allowing both the public sector to introduce innovations faster and industry to be the first to exploit new lead markets.”⁵¹

According to the EC Communication pre-commercial procurement has the following characteristics:

- ⇒ risk-benefit sharing according to market conditions
- ⇒ competitive development in phases
- ⇒ separation of the R&D phase from deployment of commercial volumes of end-products

⁵¹ COM(2007) 799 final: Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe.

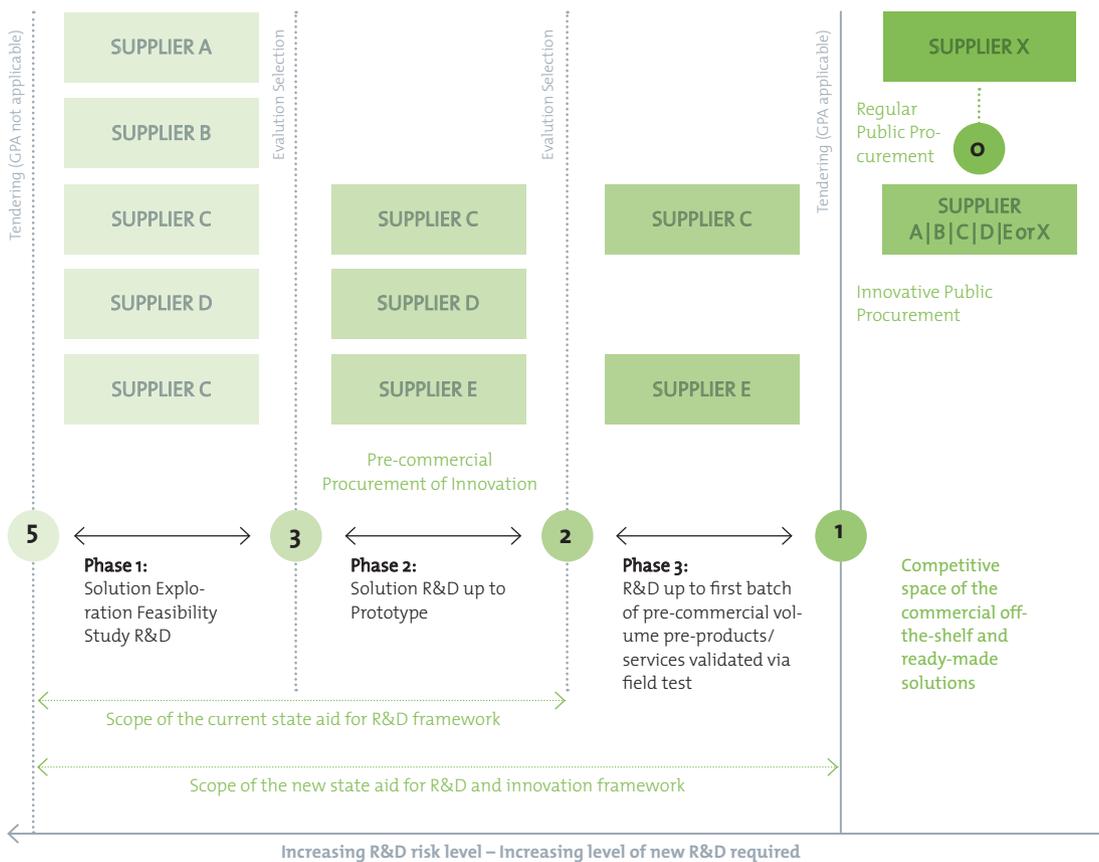


Figure 5

Pre-commercial procurement: A phased risk-shared benefit approach (modified structure taken from Communication from the Commission, “Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe”, (14.12.2007))

The last of the characteristics allows to lower the risk in the full scale commercial procurement in a separate preceding phase. As a consequence a procurer is shielded from possible technology failure in commercial procurement. There is an analogy and fit between the relation pre-commercial/commercial procurement at the demand side and R&D/commercialisation at the supply side. Both the R&D and the pre-commercial phase have the purpose to lower the risk for future valorisation and have a market value that can be calculated as a financial option. In summary pre-commercial procurement is a vehicle that allows the procurer to take risk in the preparation phase and allows him to be more risk averse in the commercial procurement phase that follows.

The pre-commercial procedure is envisaged as a method to exclude state aid and to enable the contracting authority to identify the best solution on the market. From a conceptual point of view pre-commercial procurement is focused on the development of new technologies and not on the development of incremental or transitional technologies. Often it is questioned whether pre-commercial procurement is real procurement or whether it is nothing more than a kind of subsidy. As described above, in pre-commercial procurement the government is taking the initiative in order to get access to innovation to improve its operations or to solve major socio-economic problems for the benefit of society. This is in contrast to subsidies where the supply side takes the initiative and where the government has

no interest in the outcome of the development effort. In pre-commercial procurement the contracting authority wants to know whether a solution to a given problem is possible and how to optimise/speed up its access to an innovative solution. This is worth money for the contracting authority through the option characteristic of pre-commercial procurement. Through above characteristics pre-commercial procurement is to be considered as procurement (at market price) and is completely different from subsidies.

There are several advantages linked to exception 16(f) of directive 2004/18/EC:

- ↳ There is no obligation to follow the strict procurement procedures (rules about when to use a procedure, formats, timing) as described in the procurement directives: a free format can be used, such as a subsidy-like format that allows a company to use technical language and explain what the advantage of the proposed solution might be.
- ↳ The selection criteria can be kept minimal or made redundant.
- ↳ The award criteria can be focused on the innovative characteristics of a proposal; the attractiveness, potential and innovative character of proposals can be judged by an independent expert jury. It has to be mentioned that judgement of aforementioned characteristics can not always be done in a quantitative way, especially when the products/services still have to be developed.
- ↳ The procurement process under the exception of art. 16(f) is not subject to the remedies directive.

Challenges related to the transition between pre-commercial procurement and commercial procurement

One of the main challenges contracting authorities are facing on legal level is the transition from pre-commercial procurement to commercial procurement: one

can argue that the participants in the pre-commercial phase enjoy a competitive advantage (superior knowledge of the public authority and its procedures, a competitive advantage due to the financial compensation, a superior knowledge of the technical environment and the needs of the public entities) that distorts competition in the commercial procurement phase that follows. Through all these elements the participants to PCP will be placed in a position that allows them to submit better bids. This advantage can be described as an “inherent de facto advantage”. It would not be viable and against the principle of fair competition to penalise such a competitive advantage by obliging the contracting authority to reject bids from these parties enjoying such a de facto advantage. In fact the de facto advantage cannot be considered as more threatening to competition than the advantage acquired by a former contractor when bidding the next time for a repeat order.

There should be no problem in the transition between pre-commercial procurement and commercial procurement, if the contracting authority behaves as follows:

First, the whole process comprising market consultation, pre-commercial procurement and commercial procurement, starts by communicating to the market how the process will be conducted, with indication of timing and outlining the contracting authority's behaviour vis-à-vis the market players. The winners of the pre-commercial procurement are delivering knowledge and IPRs in the pre-commercial phase and this at market price⁵². The knowledge acquired by the contracting authority in the pre-commercial phase should be translated in outcome based functional requirements, without breaching confidentiality vis-à-vis the participants in market consultation and in the pre-commercial phase. The translation must be such that it guarantees maximum competition in the bidding process and is not written towards the solution generated in the pre-commercial phase.

The commercial procurement is opened-up to broad competition. Not only the selected companies in the framework of the pre-commercial procurement will

⁵² While the winners of the pre-commercial procurement start their development, all other partners can also start their own development if they decide to do so. For their work they do not receive a compensation, but they also have no obligation with regard to sharing knowledge or IPRs with the contracting authority.

have the opportunity to submit a bid, but also these that were excluded from pre-commercial procurement or newcomers. To this end it should provide all bidders with the information already available to the participants in the pre-commercial procurement. This does not imply though that confidential data should be made available.⁵³

4.2.2 Alternative commercial procurement methods for innovation involving R&D

So far we have shown that pre-commercial procurement through its features fits well with the characteristics of procurement of innovation. It offers the necessary flexibility in procedures and allows sharing risk and upside potential of innovation and allows focus on the innovative character of products/services from which government and society can benefit. Pre-commercial procurement however is not the only method that can be used to procure innovation for which (additional) R&D is required before it can be made available on a commercial scale. There are at least three other methods that are used in practice and are worth looking at. These are:

↳ design contest

↳ forward commitment procurement

↳ competitive dialogue

In what follows the applicability of the three alternatives will be looked at. All three methods fall within the procurement directives, which could lead to a loss in flexibility when applying one of these alternatives compared to pre-commercial procurement.

The Design Contest

A design contest is primarily meant to stimulate a creative action and is therefore suitable as an instrument in explorative pre-commercial procurement of innovation. The design contest has some interesting features: it allows stimulation of innovation and innovation to be brought to the surface at a controlled cost for

the government. The government bears almost no risk when carrying out a design contest: If no one passes a minimum performance level, there is no winner and no prize to be paid. Sweden has a long tradition with the application of the design contest for energy saving applications, whereby the government acts as a catalytic buyer, grouping the demand of private customers.

Examples of the design contest can also be found at Darpa (for example in the Grand Challenge and the Urban Challenge competition contest).

The DARPA (Defense Advanced Research Projects Agency) Grand Challenge was designed as a field test and as a tribute to the US heritage of innovation, risk-taking and a sense of team spirit. It brings together individuals and organisations from industry, the R&D community, government, the armed services, academia, students, backyard inventors and automotive enthusiasts in the pursuit of a great technological challenge. The competition's aim is to accelerate R&D in autonomous ground vehicles that can be used to save lives on future battlefields. DARPA expects to select 20 vehicles to participate out of more than 100 applicants. The grand challenge is to be considered as a demonstration/pilot project. The DARPA Urban Challenge competition pushes the limits of robotics, requiring teams to develop completely autonomous ground vehicles capable of navigating an urban environment.

In Europe the EC has supported every year, since 2000, a private design competition initiative "Lights of the Future" with the aim to transform the lighting market. Although it is a private initiative promoted by the EC, this confirms that a design contest can be used to transform markets⁵⁴.

As described in the OGC brochure "Early Market Engagement"⁵⁵, a contest can be organised for bringing up ideas. The best ideas can subsequently be taken into a negotiated procedure whereby the ideas are elaborated and in case they fulfil the expectations can be further taken in an R&D phase. Since it is about R&D services this contest procedure can also be carried out with

⁵³ P. Braun: Addressing the Competitive Advantage of an Incumbent Provider (Case T-345/03), Public Procurement Law Review (4), p. 140 (2008).

⁵⁴ <http://sunbird.jrc.it/energy-efficiency/pdf/publications/ACEE2002-paper77final.pdf>

⁵⁵ Office of Government Commerce: Early Market Engagement, Principles and Examples of Good Practice (2006).

an own design under the exception of article 16f in 2004/18/EC. It depends on the case to decide what procedure is most suitable to follow: pre-commercial procurement is probably preferred in a case where suppliers and contracting authority need to go through a long preparation phase comprising learning: gathering information, understanding the problem within its context. In summary pre-commercial procurement is probably most suitable for complex problems requiring extensive interaction with the market and learning in order to decide which direction to take. This being said, pre-commercial procurement can still result in or comprise a design contest: it can easily be envisaged that a design contest can form the first step in pre-commercial procurement procedure, whereby the market is invited to submit ideas to solve a problem (concept phase); the most attractive ideas can then be taken further through feasibility studies, prototyping and pilot test.

From the above examples it can be concluded that a design contest has several possible applications to practice procurement of innovation:

- From the Swedish experience and from the “Lights of the future” contest one could conclude that the design contest is probably very suitable for catalytic procurement whereby it is the intention to transform a traditional market with the help of innovation.
- From the competition of ideas it is also clear that the design contest can be used in the very early stages of the innovation cycle (concept phase).
- Darpa’s example also points towards possible application of the design contest in integration type of projects with a clearly defined outcome, but where the outcome can be achieved in a variety of ways through the integration characteristic of the project.
- Last but not least, a design contest can possibly give high visibility to innovators and is therefore an excellent instrument to install an innovative spirit in society. This is the case for all the examples mentioned.

Forward Commitment Procurement

Developed in the UK through a partnership between the Office of Government Commerce and the industry and led by the Environmental Innovations Advisory Group (EIAG), the forward commitment procurement model was designed as a means to enable the public sector to secure the environmental technologies and products it needs to achieve its sustainability targets, to deliver them in the required timeframe and at an affordable price.

It entails that the contracting authority provides the market with advance information about its requirement or ‘unmet need’. The requirement is expressed in outcome and technology agnostic terms, and communicated to the supply chain with sufficient time to allow the market to respond. Most importantly the requirement is articulated not in general terms but in the context of an actual procurement opportunity of sufficient scale to stimulate investment to deliver, and an offer of a forward commitment to a solution that is not yet commercially available, subject to performance parameters being met.

It differs from pre-commercial procurement, as it does not focus on R&D, but on stimulating the supply chain to invest by creating a visible and credible market (it is a ‘demand pull’ mechanism rather than a ‘technology push’ approach) and in some cases offers routes to wider markets, for example through engagement with partners with similar needs.

In forward commitment procurement, in contrast to pre-commercial procurement, the contracting authority leaves the development of the solution and potentially new innovation completely to the initiative of the supply chain (who on the basis of a visible market now is in a better position to attract investment). The contracting authority does not enter into any R&D service contract with suppliers. In forward commitment procurement this is replaced by effectively transferring the risk to the party best suited to handle it – i.e. a large part of the market risk is removed from the supplier and the technology risk made more manageable for the contracting authority.

The aim of forward commitment procurement is to build an attractive B2G market for innovative companies. It was originally designed to address market failures in the environmental industry sector. However, the forward commitment procurement approach can equally well be applied to pull forward innovation in other sectors.

It should be mentioned that unlike the design contest and the competitive dialogue, forward commitment is not a procurement procedure in its own right existing within the procurement directives. It should be seen as innovative procurement resulting from the combination of an existing standard procurement method with forward commitment to procure in order to do away with market failure.

Forward commitment procurement can be positioned as a procurement methodology for a procurement situation in between a passive contracting authority role (advisable in highly competitive markets as explained before) and pre-commercial procurement where the contracting authority is very actively involved.

Competitive Dialogue

The competitive dialogue is an adequate and flexible procedure for “particularly complex” projects, where the contracting authority is not capable of formulating the technical means or which of several possible solutions would best satisfy their needs. The use of the competitive dialogue can also be justified when they are not able to specify the legal and/or financial make-up of a project. However, it should be noted that this particular procedure may only be used in the situation that a contracting authority, without this being due to any fault on their part, find it objectively impossible to define the means of satisfying their needs or of assessing what the market can offer in the way of technical solutions and/or financial/legal solutions.”⁵⁶

Pre-commercial procurement is more adequate than competitive dialogue for the acquisition of innovative solutions that still have to be developed:

⇒ Pre-commercial procurement allows a much broader scope than the competitive dialogue procedure. In both cases the procedure starts with a descriptive document that describes the needs of the contracting authority and a view on the desired outcome of the procurement. In competitive dialogue the needs and requirements are more precisely described than in a pre-commercial procurement procedure. This is reflected in the fact that in the competitive dialogue the award criteria must be defined in the contract notice or the descriptive document. The markets may well be capable of offering a viable solution and suppliers may exist. All the elements that constitute the final solution may well be available but due to the complexity of the problem it is not known which combination of all the elements best fits the needs and delivers the required output. All this complexity is unravelled during the dialogue phase(s) after which the bidders can submit their Best and Final Offer (BAFO), which subsequently is appreciated by the contracting authority based on the MEAT concept. In order to unravel the complexity there is normally no need for additional R&D.

⇒ In the case of pre-commercial procurement, there is still no guarantee that the selected suppliers, beneficiaries of the R&D funds, will be able to provide a suitable solution for the procurer. The risks and benefits are shared between the contracting authority and the suppliers. In the competitive dialogue procedure the contracting authority knows at an early stage if the solution can be provided by the marketplace. This aspect reduces the risks for the contracting authority to a normal acceptable level.

⇒ After the R&D phase in pre-commercial procurement the procurer will have usually acquired enough knowledge about potential solutions. Depending on the situation the procurer will consider starting a commercial procurement procedure or will end the procedure. The outcome of the pre-commercial procurement process for the procurer is an answer to his need but also rewards him with partial ownership of IPR. The produced innovative products or services will normally be commercialised by the supplier(s).

⁵⁶ Procurement Directive 2004/18/
EC art. 1.11(c)

⇒ Even, if it should be envisaged that the competitive dialogue could be applied for R&D services leading to a final procurement of a commercial solution, the contracting authority is exposed to the risk of lock-in right from the start of the competitive dialogue process: those not selected at the beginning of the competitive dialogue are out for ever, even if they happen to develop the most powerful solution in parallel to the competitive dialogue process. In pre-commercial procurement however at the transition point between pre-commercial procurement and commercial procurement the commercial procurement is laid open again to the whole world and is not restricted to the original selected participants in the pre-commercial procurement process.

⇒ In summary it can be concluded that there is an essential difference between pre-commercial procurement and the competitive dialogue: whereas pre-commercial procurement has the aim to acquire knowledge whether solutions to a problem exist or can be developed within a reasonable point in the future, the competitive dialogue has as a sole purpose to buy a solution in a complex setting following the MEAT principle. The view that the competitive dialogue is inappropriate to explore truly novel innovative solutions is also expressed by MATRIX, the Northern Ireland Science Industry Panel ⁵⁷.

4.2.3 Procurement procedures as a function of innovation type and procurement position

The table below summarises above principles and gives some guidelines on which procurement procedure to use based on the position of the procurement of innovation project in the innovation matrix. The table has no intention whatsoever to prescribe what must be done in each particular procurement situation involving procurement of innovation. Such an exercise is premature since practical experience of procurement of innovation under the 2004 procurement directives and of the use of pre-commercial procurement is being built up. The table has more the intention to function as a starting point to facilitate discussion while selecting a procurement procedure.

Central in the table is the pilot project: a pilot can be considered as a pivotal point between pre-commercial procurement of innovation and commercial procurement. The procurement of a pilot/demonstrator can be either the end point of a pre-commercial trajectory, be an integral part of a commercial procurement or be a stand-alone procurement project. In the last two cases the procurement falls under the procurement directive and the preferred procedure followed in case of a pilot being an integral part of a procurement exercise is the same as for a regular procurement, either open, restricted, competitive dialogue or negotiated dependent on the case. An isolated pilot is not recommended since this is normally followed by procurement on commercial scale, which can be difficult in case of an isolated preceding procurement of a pilot due to an advantage created by involvement in the pilot phase. As far as pre-commercial development is concerned there is a preference for pre-commercial procurement over forward commitment procurement, if the contracting authority wants to play an active role in the pre-commercial phase. The design contest is the preferred approach in catalytic procurement.

Early in the development cycle the design contest can be used in its own right for catalytic procurement or as a starting point for a pre-commercial procurement process (denoted as DC ⇒ PCP in the figure below).

The combination design competition / negotiated procedure (denoted as DC/N in the figure below) can be used for feasibility studies as described in art.31(3) of directive 2004/18/EC as an alternative to PCP or FCP.

The contracting/execution phase (with special focus on IPR issues)

The EU publication of the award decision and the drafting of the final report mark the official conclusion of the procurement process. The signing of the contract marks the beginning of the contract management phase during which the procuring authority is expected to monitor and evaluate the performance of the contract.

⁵⁷ Public Procurement of Innovative Science and Technology solutions, MATRIX report: vol 7, 10, p.11, 2008.

	Available procurement procedures	DIRECT PROCUREMENT	COOPERATIVE PROCUREMENT	CATALYTIC PROCUREMENT
Diffusion		Open; Restricted; Competitive Dialogue	Open; Restricted; Competitive Dialogue	Not Applicable
Integration/adaptation comprising engineering Concepts/Ideas	Commercial Procurement (Open; Restricted; Competitive Dialogue)	Open; Restricted; Competitive Dialogue	Open; Restricted; Competitive Dialogue	Design Competition
Prototype for experimental purposes		Negotiated	Negotiated	Negotiated
R&D services not 16f		Negotiated	Negotiated	Negotiated
Pilot				
Integration/adaptation comprising major development	Pre-Commercial Procurement (free format (e.g. subsidy-like), simplified CP procedures, selection/award with focus on innovation)	Pre-Commercial procurement (Competitive Dialogue)	Forward Commitment Procurement; Pre-Commercial Procurement; (Competitive Dialogue)	Design Competition
Prototype development	↳ Design Competition ↳ Negotiated	Pre-Commercial Procurement	Forward Commitment Procurement; Pre-Commercial Procurement	Design Competition
Feasibility	↳ Forward Commitment Procurement ↳ Competitive Dialogue	Pre-Commercial Procurement; Design Competition; Negotiated	Forward Commitment Procurement; Pre-Commercial Procurement; Design Competition/ Negotiated	Design Competition/ Negotiated
Concepts / Ideas		Pre-Commercial Procurement; (Design Competition)	Forward Commitment Procurement; Pre-Commercial Procurement	Design Competition

Figure 6: Guidelines on procurement procedures as a function of innovation type and procurement position

Based on the bids received and the award criteria one or more suppliers are chosen. Subsequently the execution of a procurement, whether works, supply or services is contractually defined. As far as procurement of innovation is concerned, there are 3 important items to be dealt with in a contract:

- ↳ price
- ↳ intellectual property rights
- ↳ additional clauses such as value engineering

4.3.1 Price and intellectual property rights

In general as far as pricing an R&D service contract, IPR and the confidentiality rules that apply, it can be assumed that the same rules apply in a B2G setting as in B2B. There is a world of expertise available in B2B to find the most suitable solution for each particular B2G situation.

In procurement of innovation price is not a stand alone element. It is however one of the elements in the MEAT concept and as such it is related to the functionality/ performance of the innovation and to the intellectual property rights assigned to the buyer.

As far as pricing and IPR are concerned there is not so much a problem with innovative goods and services that are already commercially available. A correct market price is formed against the specifications and contractual clauses during the bidding process.

The situation becomes much more complex when dealing with innovation that is still under development - the more so the further the innovation is from commercial introduction (i.e. concept/feasibility, prototype development). General guidance to pricing/IPR issues in these situations is given in the EC-Communication on pre-commercial procurement and accompanying document (COM(2007) 799 final and SEC(2007) 1668).

In what follows some further guidance is formulated about IPR and pricing related to procurement of innovation with focus on pre-commercial procurement.

4.3.2 Basic IPR principles related to pre-commercial procurement

Transparent and consistent behaviour of the contracting authority is vital in the process. From the start of the process, the contracting authority needs to be clear on its strategic goal it wants to achieve. As a result, the IPR strategy needs to be in line with this strategy and the supply side is than in a position to understand the contracting authority's needs in this respect.

There are several basic IPR-principles that apply to public procurement of innovation in the pre-commercial phase:

- ⇒ The price paid is related to the level of IPR rights: the more IPR is transferred to the contracting authority the higher the price.
- ⇒ The price paid should be the market price for an innovation and may not contain a (hidden) state-aid element as explained in SEC (2007) 1668. However in some cases there can be a subsidy phase before or after a pre-commercial procurement.
- ⇒ There has to be a balance between the strategic interests of the vendor of an innovation and those of the contracting authority: the IPR may not be drafted in such a way that they create a blocking element for meeting the strategic goals of either the contracting authority or the supplier. This should be reflected in the assignment of IP rights between both parties. The more control the contracting authority wants over the application of an innovation, the more IP rights it wants. The level of control depends on the critical nature of an innovation to a contracting authority for its operations and for solutions to important socio-economic problems as well as on the degree of competition in the market.

⇒ An organisation that enters into a pre-commercial procurement will always find itself committed to give minimal access rights to the contracting authority and to candidate-suppliers in the commercial phase(s) of the pre-commercial procurement.

⇒ One has to make sure that every bidder is pricing against the same contractual clauses/obligations. A way to guarantee this is to add the contract containing the IPR clauses as part of the tender documentation.

Related to IPR is the question how the information exchange will be organised between the different actors and especially between the potential suppliers having generated certain information and knowledge in the preparation phase or subsequent phases and the contracting authority, and what kind of rights to use on such information and knowledge will be granted. An element to be taken into account is that the contracting authority will not always act with the same suppliers in the different phases which can lead to complex transactions between the actors in the different phases.

IPR models

The most obvious issue that needs to be considered is that an appropriate model or models need to be available whenever a contract in the framework of a pre-commercial process is entered into by a contracting authority. As is mentioned in the report before, in the contracting as final piece of a procurement process, IPR clauses have to be included. For the sake of the discussion intellectual property rights are also covering confidential information and know-how. One can distinguish between three basic solutions for the IP rights in pre-commercial procurement:

⇒ The contracting authority prefers exclusive development, which includes transfer of all IPR to the contracting authority. Therefore it has to pay the full market price for exclusive development, which is the full development cost increased with a reasonable profit margin. The companies that have developed the innovative

solution can not reuse it for other potential customers. Exclusive development is most of the time however not indispensable for the contracting authority unless the contracting authority have concrete plans to commercially exploit the results coming out of a pre-commercial procurement. Exclusive development if not indispensable means a waste of money for the contracting authority; it can be justified in some cases such as defence or security related fields. Exclusive development can in most cases be replaced with the following solution.

⇒ An adequate solution in most pre-commercial procurement cases is to keep as much IPR as possible with the vendor and to transfer only those rights to the contracting authority that it needs in order to satisfy/safeguard its strategic goals.

There are basically two scenarios in this model with partial IPR transfer to the contracting authority:

⇒ In case the supply side is very thin and the innovative solution is critical for the contracting authority, the contracting authority may want to secure its access to a commercial solution that follows from the pre-commercial procurement. In order to avoid legal issues with regard to state aid, a market price needs also to be set for this situation. This model has been outlined in the pre-commercial procurement Communication of the Commission of December 2007. The business rationale behind this is that since the concept remains with the technology vendor, an incentive is created to participate in a pre-commercial procurement project, due to the possible broad valorisation of the technology at stake.

However it is also understood that the contracting authority is in need of certain rights, in line with its strategic goals. This may include that the technology vendors may on the one hand be the owner of the IPR, but on the other hand also needs to grant certain user rights to the contracting authority. Most of these user rights will become effective only at the moment that the contracting authority enters into a contract as a result of the outcome of a standard procurement

process under the procurement directives, and the contracting authority awards a contract to the technology vendor that has successfully ended the pre-commercial procurement process. As a consequence thereof, the technology vendor is obliged to offer in the subsequent procurement procedure on reasonable commercial terms. Eventually the technology vendor in the subsequent procurement procedure will have to reduce his price or pay a royalty to compensate for the price paid and the risk shared in the pre-commercial procurement trajectory.

However there is a possibility that the contracting authority is not granting a contract to the original technology vendor being awarded the contract in the pre-commercial procurement process, but has to grant the contract to a different technology vendor/supplier. For that situation, it is needed that in order to avoid possible IPR infringement procedures and claims in the context of the procurement phase, the original technology vendor under the pre-commercial procurement process is obliged to grant licenses on commercial terms to possible competitive parties. It is understood that these licenses have to be granted before the contracting authority enters into a contract with the competitive supplier in the procurement process.

It is also understood that there is a possibility that the contracting authority expects a return on investment from the money spent in the pre-commercial procurement process. This return on investment can take different forms: e.g. by a discount model in the procurement process on the price of the technology offered. This return on investment model also needs to be communicated to the possible technology vendors at the beginning of the pre-commercial procurement process.

⇒ In case the contracting authority feels confident that the supply side is rather competitive, it may be sufficient to find out that an innovative solution to a problem is possible. In order to find this out, the contracting authority can start a pre-commercial procurement trajectory whereby the IPR rights for the contracting authority are kept minimal (e.g. access to confidential

information and access right to test a prototype). The consequence of this is a low price to be paid to the developer of an innovative solution. In case the pre-commercial procurement process proves that a solution is feasible the request for a solution is transferred to a commercial procurement process, whereby standard IPR clauses for commercial procurement are applicable.

In general the price paid by the contracting authority in this scenario will be low due to the limited IPR transfer to the contracting authority (estimated at 10-20% of the development cost). As such this might not be attractive for a particular supplier. However nothing prevents a supplier to apply for an R&D grant under this scenario since the development and the pre-commercial procurement -transaction with the contracting authority are well separated things.

Definitions and contractual clauses about IPR are available from different sources. Especially helpful are the IPR regimes of the EC Framework Programme ⁵⁸ which are further elaborated in different models of consortium agreements, ^{59, 60} (IPCA, DESCAs, EARTO, etc.). The different agreements are compared by the IPR-helpdesk supporting the EC Framework Programmes. ⁶¹

The parties involved in a contract define the national law that will govern the contract. In case of an international cooperation the contracting authorities could choose for a national law that leaves maximum freedom to handle the IPR aspects in a contractual way.

As outlined in the introduction, the strategic goals of a contracting authority will be different in direct/cooperative and catalytic procurement. This will have an impact on the IPR model chosen in pre-commercial procurement. The difference between direct procurement and cooperative procurement is the characteristic that the market behind cooperative procurement is in general bigger than in direct procurement. This gives the contracting authority somewhat more comfort that the supply side will be more eager to enter into a development process than in a direct procurement application. In such a situation the contracting authority might be

satisfied with minimal IP rights in the pre-commercial procurement process.

The same can be expected in catalytic procurement, unless the final goal is of high strategic importance in combination with a thin supply market, such that a high level of IP rights might be necessary in order to safeguard future commercial availability.

Value engineering

Especially in long term contracts, it is important to offer contractors/suppliers the possibility to frequently improve the price/quality-ratio of their products. The best way to achieve this is to add value engineering clauses to the contract. The concept of value engineering has been developed in the defence industry during the Second World War. In the United States the concept of value engineering is defined by law ⁶² as being “an analysis of the functions of a program, project, system, product, item of equipment, building, facility, service, or supply of an executive agency, performed by a qualified agency or contractor personnel, directed at improving performance, reliability, quality, safety, and life cycle costs.”

The basic philosophy behind value engineering is the fact that it is built on a win-win relationship: the benefits that are the result of improvements are shared between buyer and supplier. This is easy to apply when improvements result in a lower cost for the same functionality/performance. It becomes however much more difficult to calculate and share benefits in case functionality/performance can be increased. We have not found methodologies that allow handling of this kind of situation: this will most probably have to be handled on a case by case basis.

An alternative to value engineering clauses is to close only short term contracts, which can be renegotiated each time. Short term contracts however can prove to be inefficient for innovative products/services due to high switching costs and risks.

4.3.4

⁵⁸ EC Guide to Intellectual Property Rules for FP7 projects: ftp://ftp.cordis.europa.eu/pub/ftp7/docs/ipr_en.pdf

⁵⁹ EICTA FP7 Integrated Project Consortium Agreement-IPCA: www.eicta.org/web/news/telecharger.php?iddoc=632

⁶⁰ DESCAs: Development of a Simplified Consortium Agreement for FP7: http://www.desca-fp7.eu/fileadmin/content/Documents/DESCA_version_2_final.doc

⁶¹ http://www.ipr-helpdesk.org/documents/ComparisonFP7/Model_000006611_00.xml.html

⁶² US code, title 41, chapter 7 par. 432

5 Concluding Remarks

As has been seen in this document, many groups of actors are involved, with different rationales for behaving in certain manners concerning public procurement. The complexity also affects the possibilities for different actors to understand each other, since they use their own vocabulary and construct their own “story”. Innovation policy experts, or politicians looking to promote economic growth, would probably describe certain procurements in a completely different way than the procurer of the concerned contracting authority, or the supplier. A public purchaser in a contracting authority seldom procures products for the sake of promoting innovation and might not even recognise when a procurement process deals with innovation. They care (rightly so) about their own goals and are “blind” to the aspect of innovation.

The challenge then is to encourage a better understanding between different groups of actors. To aid this, politicians within different policy fields need to take care to set up incentive structures that take into account the effect of other fields as well, as their decisions taken together forms an integrated system or pattern. More communications about political goals and how they affect each other is needed. A special recommendation for the European Commission is to encourage different Directorate Generals to integrate their operations when it comes to public procurement, for example by looking over the procurement directives from the perspective of different policy areas and their goals (competition; innovation; environment etc.).

Another important point to remember in the context of conflicting public goals is the role of the procurers. When procurers decide on which evaluation criteria to use for evaluating the bids in a procurement process, they in fact “decide” which political goals are prioritised. In this process every demand, deriving from the political goals, must be weighed against each other, but also against value for money. Additionally, the demands must also be made in compliance with the legal framework and case law. If the procurers have received clear instructions from politicians; and if they themselves have been part of the strategic process of their public authority, this is a feasible task. If not, which is too often the case, procurers may easily find themselves in a “Bermuda Triangle” of public purchasers, where political goals compete between themselves and also with two other pillars of the public procurement system the legal framework and value for money.

Thus, the conclusion is that to use public procurement to drive innovation, politicians at all levels must integrate different political goals and send more coherent signals to public authorities, as well as look over regulations (and perhaps also the possibility to provide support for suppliers). Public procuring authorities, in their turn, must realise the strategic values of purchasing, and upgrade the position, as well as broadening the training, of public procurement officials.

ANNEX – Cases

In the second half of 2007, a number of cases of public procurement leading to innovation were collected by the OMC-PTP project members. The case studies were performed by the partner countries to better understand the role of public procurement as a means to stimulate innovation. This annex offers an overview of the implementation of public procurement of innovation in selected Member States. The ambition was to collect cases from different industries, different types of contracting entities, where different procurement procedures had been used and with varying results.

Belgium *e-ID card*

After a political decision in 2001, this procurement project was set up by the Ministry of Internal Affairs, General Directorate, Legislation and national institutions, national register. The purpose was to procure an electronic identification card (e-ID card) to replace traditional ID cards.

To the contract there were also services attached. The intended use for the e-ID card was traditional ID authentication but also functionality enabling e-authentication and other functions related to e-government.

This project consisted of several calls for tenders. Initially one call was published for e-ID card prototypes. The procedure applied was the negotiated procedure with a tender's notice. No financial compensation was paid for the delivery of the prototypes. At this stage the complete exploitation of infrastructure for the e-ID card was also put to tender. This was also following the negotiated procedure with prior tender's notice.

This was followed by a contract that included delivery of technology for a pilot phase covering 11 municipalities which was to be followed by a full scale introduction in Belgium (conditional upon a positive decision of the council of ministers after the pilot phase). The procurement procedure that followed was the open procedure. Since no party fulfilled the requirements of the open tender, a switch was made to the negotiated procedure. This made it easier to compare the different offers and to eliminate differences in interpretation of the requirements of the tender by the suppliers.

The introduction of the e-ID card in Belgium can be seen as an integration type of innovation, consisting of integration of existing technology for the new e-ID application and secondary applications. However, the chip on the e-ID card is considered the most innovative part of the e-ID innovation. It is a processor chip that makes use of the public key infrastructure-solution for the authentication and electronic signature function. The success of the innovation is due to its imperative use for each Belgian citizen that guarantees the diffusion aspect of the innovation.

Belgium *Soot filters*

In interaction with the Ministry responsible for Mobility and Public Works it was decided that De Lijn, a public transport company in Belgium should equip their whole bus fleet with soot-eliminating filter systems. The ultimate aim of the procurement project was to equip the fleet of busses with exhaust systems that eliminate soot emissions by at least 85%. Soot control technology was already available at the time for these projects. The technology was, however, not proven and it also needed to be integrated in existing buses. The project

can therefore be described as an integration/diffusion type of project.

De Lijn, acting as a public entity, carried out a series of procurement projects exclusively by internal personnel as follows.

This project consists of an array of consecutive procurements. Initially, the restricted procedure without publication was applied. Three suppliers were invited to make an offer on prototype development. This led to seventeen buses being equipped with soot filters. After this small project was successfully carried out, it was decided to equip the entire fleet. A first series of 236 soot filter systems were ordered after an open procedure. Since the result was very satisfactory, it was decided to equip the remaining 166 buses of the equal make with the same filter system after a negotiated procedure with the actual supplier resulting in a price decrease of 6%. For another lot of 92 buses with different engines the open procedure was pursued and for still another set of 17 buses also the negotiated procedure was followed.

However, the negotiated procedure with prior tender's notice was felt more suitable for technology procurement with a degree of complexity typical for a soot filter system. For another set of 49 buses only one supplier offered a prototype.

De Lijn seems to be a public company that keeps in pace with the general technological development by behaving as a fast follower. De Lijn gets access to innovation without being exposed to the technology risks inherent to being the first mover to introduce new innovation. A

central tool for risk reduction is the use of prototyping throughout the project.

It is noteworthy that prototypes from different suppliers were acquired and tested in parallel. This is somewhat similar to the pre-commercial procurement process proposed by DG-INFSO. Due to the relatively low unit price for a filter prototype (<8.000 EUR for a soot filter and <25.000 EUR for soot-filter equipped with NOx-reduction) and to the fact that the prototypes were used for test purposes, the prototypes could be acquired in a procedure without publication according to article 40 (2)(b) in the new directive 2004/17/EC.

Belgium *Mobile Ticketing*

This was yet another project carried out by the public transport company, De Lijn in Belgium. The ambition of the procurers was to improve passenger flow and in particular the handling of pre-sales of tickets. Mobile-ticketing was seen as a new and complementary pre-paid ticketing system. In this system the travel warrant is delivered in the form of an SMS, without pre-registration by the passenger. The price is collected by a GSM-operator and transferred to De Lijn. M-ticketing is already common practice in some other European countries. Therefore this project can be classified as technology diffusion.

The aim of this procurement project was to acquire a platform that enabled M-ticketing.

In preparation of the procurement project, a study was carried out that proved that De Lijn had the required capacity to introduce M-ticketing. A market survey was

carried out and commercially viable M-ticketing platform technology was identified.

The procedure used in the full tender call was the negotiated procedure with a tender's notice. As selection criteria the candidates had to prove their competence on the following criteria: a reference list of similar projects, written evidence from customers testifying compliance on user-friendliness, speed of implementation, technical support, reliability and security of the platform technology, a list of feasibility studies carried out in the last 3 years, qualification of personnel delivering the M-ticketing platform, proven membership of the International Association of Public Transport was considered as a plus. The award criteria followed the MEAT principle: one of the criteria was fraud-resistance of the technology offered.

14 candidates replied to the tender. The contract was awarded to a candidate that had already developed a system in another country.

Belgium *Outdoor City WI-FI System*

The project involved the procurement of wireless outdoor WI-FI connecting service that would be offered to tourists and increase the technical support capabilities offered by the city.

As an initial step a pilot project was run by a young tech company that proved that a wireless mesh-based outdoor city WI-FI network was technically feasible to low cost. The idea was to offer tourists access to the network, but there were also other possibilities of utilising the system by the city.

The type of procurement procedure applied was the open procedure. The tender was only published in the Official Belgian Journal for publication of public contracts.

The wireless network itself is set up by the supplier. For this network the city is not paying. In exchange the supplier offers the use of the wireless network to the

citizens/tourists to enter into the web: through this set up the trial of last year can be continued in 2007 without charging the city. The supplier(s) and city still have to explore and develop a business model for such a WI-FI system.

What is noteworthy is that this procurement project seems to be the result of a user-producer interaction, i.e. interaction between a technology supplier and the city which is interested in new ways to advertise the city of Blankenberge as an attractive holiday destination.

There were initially fifteen interested technology suppliers. Only one offer was received by the procurer. This offer came from the supplier that had delivered the initial trial set-up. For this reason the tender has not yet been awarded. The city hesitates to award the contract to the single bidder since public tenders in Flanders are nowadays under scrutiny. An alternative currently under consideration is to put out a reduced tender for a limited set of functionalities that can attract more tenderers.

If one regards this as a pre-commercial project, one could wonder why the city decided to use the open procedure and not the perhaps more suitable alternative, the negotiated procedure.

Latvia *IPE-Magnetics*

The general rationale for this procurement was a perceived need to upgrade old-fashioned laboratory equipment in state research institutes. A decision to do so was made by the Latvian government in 2004. The procurement project, once carried out, would render the possibilities to further development of investigations of magnetic field of complicated ferro-magnetic structures for sensible measurements of electro-physical processes.

The Institute of Physical Energetics Latvian Academy of Sciences (IPE) was carrying out the procurement. More specifically, the purchase consisted of histogram, two different Gauss meters and an impulse magnetizer. The

contract also included installation and warranty service. The procedure used for the procurement was the open procedure. The purpose of the procurement was direct – to satisfy the need of procured institution and its end users. The invitation to tender was published on the home page of the “State Procurement Supervision office”. The procedure was realised in accordance with national legislation “Law on public procurement”. The main award criteria followed a principle that could be summarised as follows. The contract was to be given to the tender with the most favourable price that offered delivery in full accordance to technical specification. Four companies from different countries expressed interest for the tender. Two complete responses were submitted.

The main difficulties of this case were lack of experience of involved staff of IPE about procurement process, but it did not affect outcomes – users are very satisfied, and the Institute evaluated this deal as very successful.

Latvia *Institute of Polymer Mechanics – Material Testing System*

The general background for this procurement project was an ambition from the Latvian government to upgrade the old-fashioned research infrastructure which did not respond to contemporary needs. In 2004, the Latvian government decided to invest into public research infrastructure.

The procured item in this project was a scientific tool, a Material Testing System (MTS). Included in the contract were components, installation, adjustment and services. The future user of MTS was the Institute of Polymer Mechanics (IPM).

The division of labour in this project can briefly be summarised as follows. The Administration of the University of Latvia brought in the procedural expertise for the procurement process. The IPM engineers prepared function-based technical specification of needed components. No intermediaries were involved. Procurement capabilities were covered internally with some

consultancy of procurement support organisation.

The purpose of the procurement was direct – to satisfy needs of procured institution and its end users.

The procurement procedure used was the negotiated procedure without notification. The University of Latvia had asked and received from the Latvian State Procurement Supervision Office sanction to apply this exceptional procedure.

The main criteria for procured technique were the highest quality and sensibility of all components of MTS. Other criteria including price were not given high emphasis.

All obligations were accomplished in accordance to the contract and purchaser was fully satisfied with the quality of provided service.

The main difficulties of this case were lack of knowledge and experience of involved staff of IPM about procurement process, but it did not affect the outcomes.

The Netherlands *Intelligent Speed Limiter for Delivery Vans*

This procurement project relates to policies developed by the Ministry of Traffic and Water Management (V&W) concerning traffic safety. In 2005, the idea was forwarded that it should be possible to install speed limiters in delivery vans. Besides already existing functions of hard restriction (fuel truncation above a certain speed), this technology would also include other driving assisting features. One such example was speeding warning systems and other possibilities for monitoring driving behaviour. The combination of these functions was not yet available.

The idea was initially to install the system in vans used by an internal V&W organisation, and thus be able to demonstrate the technical and potential commercial viability. After intervention of the minister of Traffic and Water Management herself, V&W broadened the project and included also other potential users and producers.

Essentially, V&W created a situation where risk was reduced both for the supplier and for the (potential) users. In that sense, although such development remains to be seen, this project can be seen as an example of catalytic procurement, i.e. where a public agency procures an innovation on behalf of others. To reduce producers' hesitations stemming from the prospect of facing R&D-costs, with no guaranteed sales and demand, V&W decided to lease about 100 systems for the duration of a test period.

The selected producer would receive a discount of part of the R&D costs in the lease price. V&W is leasing 100 systems for the participants, so they can participate in the test risk-free (apart from effort/time and a deposit of 375 EUR for the equipment).

The test phase started November 2007. Nine private fleet owners were participating by then. After the test V&W will withdraw from the project and leave further development to the market. Participants and supplier that have participated in the test phase will mutually determine if they will continue the lease further, buy the system or return it.

V&W has the intention to buy a slightly adapted system for one of its internal organisations if the test results are positive.

By procuring and demonstrating a non-existent system, V&W seems to have succeeded in introducing a road safety device that otherwise would not have been available.

The Netherlands *Energy Producing Greenhouses*

This project was developed in harmony of a general awareness of the social effects and economic threats associated with the use of high levels of fossil energy. The greenhouse sector in the Netherlands accounts for 10% of the total national consumption of natural gas. It is responsible for 4% of the CO₂-emission. The ambition is to have all new greenhouses in 2020 build in a fossil neutral way.

Therefore the Dutch horticulture and the Ministry of Agriculture, Nature and Food Quality took a joint initiative and organised the Energy-producing Greenhouse Design Competition. The idea was that organising a design contest would stimulate the market to come up with pioneering ideas that would help achieve the environmental goals. The design competition Energy-producing Greenhouses is started under the auspices of the Greenhouses as Energy Sources Steering Group. The Steering Group is composed of representatives of the horticulture businesses, government and external experts.

The design contest has been published in the EU Official Journal and in other publications. The competition was opened on August 31st, 2005 and was closed on January 12th, 2006. All conceivable market players could react: the horticulture industry, growers, universities, institutes, civil society organisations and other interested parties were challenged. The competition was open to entrants from around the world.

An independent jury consisting of experts in the field of horticultural production, energy and transition processes was set up. The task of the jury was to evaluate and judge the entries according to the criteria listed in an evaluation matrix. These criteria were fully public.

The procedure for the design contest can briefly be summarised as follows.

First phase – preliminary sketch: sketch designs are accepted from anyone who wished to participate in the design competition. No reimbursement was available at this stage.

Second phase – further development of proposal: selected proposals were asked to develop a preliminary design with detailed technical plans and descriptions. At this stage entrants could receive a reimbursement for the costs incurred up to 45.000 EUR.

Third phase – prototype development: three consortia were asked to develop a final design for a prototype. The prototypes operated for six months to a year. A

reimbursement at this stage was available up to a maximum of 200.000 EUR.

Fourth phase – testing: the best prototypes took part in a trial to demonstrate the functionality and reliability of their designs under actual cultivation conditions. At this stage a reimbursement was available for up to 400.000 EUR.

42 sketches were submitted. Two proposals were excluded from participation because they lacked crucial information. 13 proposals managed to get through the first phase. 10 got through phase 2. Finally 3 winners were asked to develop their proposals for testing. This phase was completed in 2008.

The government does not buy greenhouses to satisfy intrinsic needs. In that sense this procurement project may be regarded as catalytic. Its policy is to foster the private use of a new product (i.e. the energy producing greenhouse). The development of such new technology has apparently not been taken up by the private sector on its own. The market possesses the know-how and expertise required to assemble a total concept, but some further coordination is needed to utilise this knowledge in order to come up with concrete solutions. Knowledge and experiences from the design contest will in the course of 2008 and 2009 become available to the horticultural sector. The submissions of the other, non winning, participants yielded promising techniques as well. This means that there may be possibilities also for the innovative ideas of these participants to find their way into practice and made available to the greenhouse sector.

The Netherlands *Extension elevators*

In the Netherlands, many three- and four storied older apartment buildings have not been equipped with elevators and are thus not serviceable for older tenants who would like to keep on living there. The Foundation for Experiments in Social Housing (SEV) took the initiative with a number of producers to develop and build an extension elevator that can be installed cheaply in

this kind of buildings. SEV has formulated a cost/quality test, so producers could carry on with the development process. The embryonic market has been stimulated by the Ministry of Housing by a temporal subsidy. Extension elevators are a normal option nowadays for renovating older neighbourhoods, social structures remain in place and social costs are being avoided.

SEV developed technical specifications, mitigated safety regulations and invited some 10 companies to do product development. These included settled elevator companies as well as niche players and newcomers, even from abroad (Sweden). The 4-year experiment resulted in 450 elevators. A part of the experiment was market development by SEV (approaching social housing corporations, tenants, municipalities and the Ministry of Housing for a temporal subsidy and modifying safety regulations).

Procurement was carried out by each social housing corporation in each individual project (the largest project being a series of 254 elevators for 2400 apartments). Mostly they contracted in a restricted or negotiated procedure a builder that cooperated with a specific elevator supplier (2/3 of the costs being for construction-technical alterations, 1/3 for the elevator).

Installations that passed requirements in a cost/ quality test could apply for the government subsidy.

After the last year of the subsidy scheme (1991) the construction of added-on elevators fell down to a fairly low level. The provisions in the new building regulations with regard to elevators have been modified to the extent that apartments built nowadays must have a spare space in which an elevator can be placed. Safety regulations are also nowadays open for alternative solutions. The fall in costs of elevators has been lasting, which may have helped industry acquiring a larger market.

Germany *Fuel Cell Buses*

The purpose of this project was to procure fuel cell buses to be used in the public transport system of

Hamburg. The organisations involved in the project were the Hamburg State Ministry for Urban Development and the Environment, Energy Department and the City of Hamburg. The procurement project was preceded by an EU-funded project called CUTE, which is a network devoted to the procurement of fuel cell buses.

A general concern for environmental issues may be seen as the starting point for this procurement project. In combination with alternative energies, these buses are environmentally sound and a real alternative to traditional fuel buses. Introduction of this technology would render positive effects on the air quality of the inner city of Hamburg and also make the vision of a zero emission vehicle come true.

The process leading to the procurement of fuel cell buses was a structured process that can be summarised as follows.

1st step – decision by the senate of Hamburg to establish the initiative “Fuel Cells and Hydrogen Technology Hamburg”. This group was set up to enable collaboration and information change. Members of the group were companies, research organisations, universities and public authorities working with these issues.

2nd Step – Hamburg participated in the EU project CUTE (Clean Urban Transport for Europe) as mentioned above. The city-owned enterprise “Hamburger Hochbahn AG” procured 3 buses and tested them for every day usability.

3rd Step – initiation of a global buyer network for fuel cell buses (including cities such as Barcelona, Amsterdam and Perth). This network would generate bundling of demand for fuel cell buses which would create a market, and also foster a decrease of the purchase price.

Hamburg is not the only city that has purchased these buses. Other cities have implemented this technology in their public transport system as well (Amsterdam, Barcelona, London, Perth). All cities signed a memorandum of understanding in order to bundle market inquiry.

This leads to cost reductions and an amelioration of negotiation position versus the supplier which would foster decreases of purchase price.

Germany *Public Railcars with Particle Filters*

The purpose of this procurement project was on the one hand to purchase new railcars to meet the increased number of passengers and on the other hand to find a technological solution to meet EU emission standards for rail traction engines. The winning bidder offered vehicles equipped with particle filter systems in the engine system. The procuring and contracting authority was the fahma GmbH (Fahrzeugmanagement Region Frankfurt RheinMain GmbH).

The decision of equipping railcars with particle filters had political backing and was in line with the climate protection strategy of the Rhein-Main Transport Network. Both political will and climate protection strategy aim at reducing the emission levels of particulate matters in public transport.

The European tender was carried out as a negotiated procedure. This gave companies the opportunity to discuss technical details in advance. The public purchase of particle filters for diesel railcars included research and development because an economically efficient and an ecologically justifiable solution had to be developed. Fahma asked for a concept for a particle filter and therefore created a public demand for this technology. The final solution created a business case at international level.

Policies and rules that affected the procurement were European guidelines, EU public procurement directives and technical specifications. The rationales behind the tender were mainly environmental reasons. From the beginning, it was intended to meet the EU emission standards or to achieve even better values.

The key factors to the success were: the political backup and the consolidated procurement team. Thanks to the political backup which was mainly caused by the

ongoing discussion on particulate matters, demanding an innovative solution as regards to particle filters was welcome which lowered the risk aversion. Furthermore, the procuring authority engaged two people to take care of the process and an engineering bureau that ensured technical knowledge. This means the number of persons involved in the process was very small which had a positive impact on the communication within the procuring authority but also on the relation between demand side and supply side.

Slovakia *Group Video Conferencing System*

The procuring authority was the Public University of Zilina, more precisely the Institute of Competitiveness and Innovations. The intent of the procuring authority was to establish a group videoconferencing system placed in a conference room, which enables a parallel connection of several clients. The project would ultimately lead to the set up of a special multimedia videoconferencing lecture rooms equipped with technology enabling high-end picture and acoustic quality, which would create possibilities to organise videoconferences with distant entities, clients, partners in Slovakia or elsewhere.

The whole procurement process took place at regional level. The procurement procedure was open to all legal entities in the Slovak Republic able to fulfil the selection criteria. The procurement procedure used was the negotiated procedure with a tender's notice. The underlying reason for this choice was that the content of the procurement did not allow concrete and exact definition of technical requirements and the performance and price parameters of the procured technology.

The procuring authority implemented the process of public procurement using the service of expertly capable person, i.e. an independent consultant.

Two companies were involved in the procuring process. The evaluation of both offers and comparison of proposed technology with specified parameters were carried out by an evaluation committee consisting of members with professional skills in IT.

The practical meaning of this study consists in the used method of public procurement – negotiated procedure with publication. This method of public procurement uses the active dialogue – communication between procurer and potential subcontractors of the procurement matter in preparatory phase of the procurement.

The output of this method are specified and defined requirements with technical and financial quantification. The contracting authority obtains a real picture of the procurement matter and thus presents possibilities of further implementation.

Sweden *Stockholm Road Tax*

This case was propelled by a lively debate taking place in 2002 on congestion, where the question of congestion charges in Stockholm became one of the main issues. This case involves many different actors in society, political parties, different public agencies on different levels in society, members of the public and potential suppliers. The story includes changes in law, over time it was handled by different public agencies, the case was brought to court, and a referendum on the issue was held in Stockholm. To review and fully give all the details of all these developments is not possible here. A brief overview of the developments can be summarised as follows.

Autumn 2002 – initial model and system discussions are held.

February 2003 – an Environmental Charges Secretariat is formed within the City of Stockholm.

2 June 2003 – the Stockholm City Council approves a trial run of a traffic congestion system. The Stockholm City executive board is to procure a technical system, including services, to handle the congestions charges.

27 June 2003 – the City executive board approves of the principles and underlying material for the procurement.

2 July 2003 – certain suppliers are invited to submit tenders. The procurement procedure applied is the negotiated procedure. Six companies were interested and four of these became part of the procurement process.

18 April 2004 – the government asks the parliament to approve a law to install congestion tax.

16 June 2004 – the law is passed. Since it is a national tax, the City of Stockholm can no longer be responsible for collecting it.

1 July 2004 – the Swedish Road Administration takes over the procurement from the City of Stockholm. The Administration will be responsible for building and operating the system for the congestion tax, including the collection of the tax and public information in this regard.

9 July 2004 – IBM is awarded the contract.

16 July 2004 – the decision is opposed in court. The procurement cannot be finished. The case bounces back and forth in different courts.

1 January 2005 – the law is enforced, even though the legal question of the procurement remains unsolved.

30 March 2005 – the final legal decision is made. The procurement is declared legal and The Swedish Road Administration can continue ordering needed equipment and services according to the contract with IBM.

3 January 2006 – the trial of the system begins. Stockholm will have a congestions tax system for the next seven months.

31 July 2006 – the trial ends.

17 September 2006 – a referendum is held, where a small majority in the proper City of Stockholm votes to keep the tax. In the greater region, the vote is negative to the tax.

The newly elected government decides to keep the tax.

1 August 2007 – the congestion tax system is reinstalled.

Remarks on the annex

The case material included in this report offers a wide range of public procurement projects which to a different degree has contributed to innovation. A common feature of many of these projects is a high level of political backing. For instance, several projects devoted to the procurement of environmentally-friendly technology have emerged from a general policy emphasising encouraging development of such technologies.

Another interesting pattern in the material concerns the use of a combination of different measures to stimulate innovation. Public procurement is one tool used together with other innovation stimulating activities. For instance, public agencies have used subsidies for research and development, funds stemming from participation in e.g. EC-funded projects and also launched different kinds of research activities. This variety is also evident the way procurement procedures are used. Although there seems to be an increasing awareness of procedures allowing interaction such as the negotiated procedure, many times different procedures may be used over time.

A final remark, necessary to make, concerns the question to what degree innovation has been procured in the cases drawn on here as most of the cases concern incremental innovation. Some of the cases even come very close to regular procurement of existing goods. The argument brought forward here is however that public procurement of incremental innovation, as well as public procurement leading to diffusion, might still be preferable, if the only alternative option is to procure regular goods. The possibilities for public procurement of radical innovations may in practice appear on very rare occasions.

Abbreviations

B2B	<i>business to business</i>
B2G	<i>business to government</i>
BAFO	<i>best and final offer</i>
BERR	<i>Department for Business Enterprise and Regulatory Reform (UK)</i>
BME	<i>German Association Materials, Management Purchasing and Logistics</i>
BMWi	<i>Federal Ministry of Economics and Technology in Germany</i>
CA	<i>contracting authorities</i>
CEMEP	<i>Commission on Environmental Markets and Economic Performance</i>
CP	<i>commercial procurement</i>
CPO	<i>chief procurement officer</i>
DARPA	<i>Defense Advanced Research Projects Agency</i>
DBIP	<i>demand-based innovation policy</i>
DEFRA	<i>Department for Environment Food and Rural Affairs (UK)</i>
DG Enterprise	<i>Directorate General Enterprise</i>
DG Research	<i>Directorate General Research</i>
DG-INFO	<i>Directorate General Information Society</i>
DH	<i>Department of Health (UK)</i>
DIUS	<i>Department for Industry, Universities & Skills</i>
ECJ	<i>European Court of Justice</i>
EZ	<i>Ministry of Economic Affairs in the Netherlands</i>
FCP	<i>forward commitment procurement</i>
Flemish OVAM	<i>Public Waste Agency of Flanders</i>
GDP	<i>gross domestic product</i>
GPS	<i>global positioning system</i>
ICT	<i>information and communication technologies</i>
IPR	<i>intellectual property rights</i>
IWT	<i>Flemish Innovation Agency</i>
KPI	<i>key performance indicator</i>
LME	<i>Law of Modernisation of the Economy</i>
LMI	<i>Lead Market Initiative</i>
LNV	<i>Ministry of Agriculture, Nature and Food Quality in the Netherlands</i>

Abbreviations

MATRIX	<i>The Northern Ireland Science Industry Panel</i>
MEAT	<i>most economically advantageous tender</i>
NDPB	<i>non departmental public body</i>
NHS	<i>National Health Service (UK)</i>
NIC	<i>National Innovation Centre (UK)</i>
NOU	<i>National Board for Public Procurement</i>
NTBF	<i>new technology-based firm</i>
NUTEK	<i>Swedish Agency for Economic and Regional Growth</i>
OCW	<i>Ministry of Education and Science in the Netherlands</i>
OGC	<i>Office of Government Commerce (UK)</i>
OJEC	<i>Official Journal of the European Communities</i>
OMC	<i>open method of coordination</i>
OPOCE	<i>Office of Official Publications of the European Communities</i>
PCP	<i>pre-commercial procurement</i>
PIANOo	<i>the Netherlands Knowledge Network for Government Procurers</i>
Pol	<i>procurement of innovation</i>
PPP	<i>publicprivate partnership</i>
PTP	<i>public technology procurement</i>
R&D	<i>research & development</i>
SBIR	<i>Small Business Innovation Research</i>
SBRI	<i>Small Business Research Initiative</i>
SME	<i>small and medium-sized enterprises</i>
STI	<i>science, technology and innovation policy</i>
TED	<i>Tenders Electronic Daily</i>
VenW	<i>Ministry of Transport, Public Works and Water Management in the Netherlands</i>
VINNOVA	<i>Swedish Governmental Agency for Innovation Systems</i>
VROM	<i>Ministry of Housing, Spatial Planning and the Environment in the Netherlands</i>
VWS	<i>Ministry of Public Health, Sport in the Netherlands</i>
WIBGI	<i>wouldn't it be good if ...</i>
WTO	<i>World Trade Organisation</i>

List of References

- Aho, E. et al.** (2006). *Creating an Innovative Europe: Report of the independent expert group on R&D and innovation*. Luxembourg: Office for Official Publications of the European Communities.
- Aschhoff, B. and Sofka, W.** (2008). *Innovation on demand – can public procurement drive market success of innovations*. Discussion Paper No. 08-052. Mannheim: Centre for European Economic Research.
- Bundesministerium für Wirtschaft und Technologie, Universität der Bundeswehr, Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.** (2006). *Impulse für Innovationen im öffentlichen Beschaffungswesen*. Berlin: Bundesministerium für Wirtschaft und Technologie.
- Commission of the European Communities** (2007). *Guide on dealing with innovative solutions in public procurement – 10 elements of good practice*. Commission staff working document SEC (2007) 280. Luxembourg: Office for Official Publications of the European Communities.
- Commission of the European Communities** (2007). *Pre-commercial procurement: driving innovation to ensure sustainable high quality public services in Europe*. Luxembourg: Office for Official Publications of the European Communities.
- Edler, J.** (2008). *Presentation at workshop of OMC-PTP*. Bucharest: 14 April 2008.
- Edler, J. et al.** (2005). *Innovation and public procurement: review of issues at stake*. Karlsruhe: Fraunhofer Institute for Systems and Innovation Research.
- Edler, J. and Georghiou, L.** (2007). *Public procurement and innovation – resurrecting the demand side*. In: *Research Policy*, 36. Oxford: Elsevier B.V.
- Federal Ministry of Education and Research, Germany** (2006). *The High-Tech Strategy for Germany*. Berlin: Federal Ministry of Education and Research.
-

List of References

- Georgiou, L. et al.** (2003). *Raising EU R&D intensity: improving the effectiveness of public support mechanisms for private sector R&D – direct measures*. Report of the ETAN Working Group on Direct Measures for Directorate General Research. European Commission.
- Hommen, L. and Rolfstam, M.** (2009). *Public procurement and innovation: towards a taxonomy*. In: Journal of Public Procurement. Vol. 9, No. 1, 2009. Florida Atlantic University: Pracademic Press.
- Jacobs, D. and Snijders, H.** (2008). *Innovatieroutine : hoe managers herhaalde innovatie kunnen stimuleren*. Assen: Van Gorcum/Stichting Management Studies.
- Jäkel, R. and Blind, K.** (2005). *Innovationsfaktor Staat – Aktiver Promoter und intelligenter Rahmensetzer*. Stuttgart: Fraunhofer IRB Verlag.
- Northern Ireland Science Industrial Panel** (2008). *Public procurement of innovative science and technology solutions*. In: MATRIX, Vol. 7. Belfast: Department of Enterprise, Trade and Investment.
- Office of Government Commerce** (2007). *Finding and procuring innovative solutions: evidence-based practical approaches*. Norwich: Office of Government Commerce.
- Office of Government Commerce** (2006). *Early market engagement, principles and examples of good practice*. Norwich: Office of Government Commerce.
- Porter, M. E.** (1990). *The competitive advantage of nations*. New York: Free Press.
- Von Hippel, E.** (1988). *The sources of innovation*. Oxford: University Press.
- Wilkinson, R. et al.** (2005). *Public procurement for research and innovation: expert group report on developing procurement practices favourable to R&D and innovation*. Luxembourg: Office for Official Publications of the European Communities.
-

Websites

<http://ec.europa.eu/enterprise/leadmarket/leadmarket.htm>

<http://standards.eu-innova.org/Pages/Steppin/Default.aspx>

<http://www.omc-ctp.eu/>

<http://www.berr.gov.uk/files/file12093.pdf>

http://www.ogc.gov.uk/documents/capturing_innovation.pdf

<http://www.berr.gov.uk/files/file12618.pdf>

[http://www.ogc.gov.uk/documents/Finding_and_Procuring_Innovative_Solutions_\(3\).pdf](http://www.ogc.gov.uk/documents/Finding_and_Procuring_Innovative_Solutions_(3).pdf)

http://www.hm-treasury.gov.uk/coxreview_index.htm

http://dius.dialoguebydesign.net/rp/ScienceInnovation_web.pdf

http://www.hm-treasury.gov.uk/d/sainsbury_review051007.pdf

http://www.hm-treasury.gov.uk/d/government_procurement_pu147.pdf

<http://www.defra.gov.uk/sustainable/government/publications/pdf/SustainableProcurementActionPlan.pdf>

<http://www.defra.gov.uk/environment/business/commission/pdf/cemep-response.pdf>

http://www.dius.gov.uk/policy/public_procurement.html

<http://www.innovateuk.org/>

Websites

<http://www.nic.nhs.uk/Pages/Home.aspx>

<http://www.vinnova.se/upload/EPIStorePDF/vp-07-03.pdf>

<http://www.pianoo.nl>

<http://www.senternovem.nl/duurzaaminkopen/index.asp>

<http://www.smepact.eu>

<http://www.modernisationeconomie.fr>

<http://sunbird.jrc.it/energyefficiency/pdf/publications/ACEEE2002-paper77final.pdf>

<http://www.sba.gov/SBIR/SBIR-PolicyDirective.pdf>

Partners of the EU-Project OMC-PTP

- ↳ Instituut Voor De Aanmoediging Van Innovatie Door Wetenschap En Technologie in Vlaanderen (IWT) *Belgium*
- ↳ VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT) *Germany*
- ↳ Ministerie Van Economische Zaken (MEZ) *The Netherlands*
- ↳ Verket For Innovationssystem, Swedish Governmental Agency for Innovation Systems (VINNOVA) *Sweden*
- ↳ Mediterranee Technologies (MT) *France*
- ↳ Latvian Technological Center (LTC) *Latvia*
- ↳ Slovenske Centrum Produktivity (SLCP) *Slovakia*
- ↳ Secretaria Autonoma De Telecomunicaciones Y Sociedad De La Informacion (SATSI) *Spain*
- ↳ Department for Innovation, Universities & Skills (DIUS) *United Kingdom*
- ↳ Technopolis Consulting Group *Belgium*
- ↳ Institutul National De Cercetare-Dezvoltare in Informatica (ICI) *Romania*

Authors of the Brochure

- ↳ Hanneke Bodewes, Technopolis *Belgium*
- ↳ Sven-Eric Hargeskog, VINNOVA *Sweden*
- ↳ Lysann Müller, VDI/VDE-IT *Germany*
- ↳ Michiel Ottolander, MEZ *The Netherlands*
- ↳ Peter Thevissen, IWT *Belgium*
- ↳ Christophe Veys, IWT *Belgium*
- ↳ Nina Widmark, VINNOVA *Sweden*

Editorial work

Lysann Müller
VDI/VDE Innovation + Technik GmbH
www.vdivde-it.de
Berlin, March 2009

Design and Layout

Isabelle Brämer
www.ib-graphik.de

Exploring
**Public
Procurement**
as a Strategic Innovation Policy Mix Instrument