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Mutual Learning Exercise (MLE)

Innovation related public procurement

Developing strategic frameworks for innovation related public procurement

Thematic Report Topic A

Research and Innovation

Developing strategic frameworks for innovation related public procurement

European Commission
Directorate-General for Research & Innovation
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Table of Contents

Abstract

This thematic report addresses frameworks for innovation related public procurement. It focuses on four specific kinds of procurement, namely (1) direct innovation procurement, (2) catalytic innovation procurement, (3) functional regular procurement, and (4) Pre-Commercial Procurement (PCP). (1) – (3) are also called Innovation-Enhancing Procurement (IEP). The four different kinds of innovation related procurement are specified in section 3.

Section 4 addresses the importance of functional procurement and functional specifications for innovation. *Functional procurement* can be defined as the procurement of products by an authority/unit that describes *a function to be performed (or a problem to be solved) instead of describing the product that is to perform the function*. In functional procurement, a public agency specifies *what* is to be achieved rather than *how* it is to be achieved. Functional regular procurement is pursued by means of functional specifications instead of product specifications. Hence, it is a matter of the *manner* in which a procurement call is set up and the tender documentation is formulated. Needs are translated into functions to which potential suppliers can respond. It *opens up* for innovation but does not *require* it. The general conclusion is that functional specification is needed for all the four different kinds of procurement addressed in this MLE. To achieve innovation through public procurement it is, somewhat paradoxically, more important to emphasize functional specification than to pursue innovation procurement.

In the 2014 EU Procurement Directives it is stated that "Functional and performance-related requirements are also appropriate means to favour innovation in public procurement and should be used as widely as possible." Sweden is the only country where the government has developed - in 2016 - a national strategy for public procurement where innovation procurement - actually meaning functional procurement - is central. This strategy is described in some detail.

Section 5 addresses the set-up of organizations (players) and institutions (rules) to pursue innovation related procurement. Section 6 deals with obstacles to innovation and functional procurement and ways of overcoming them.

1 Introduction

The goal of the MLE is to facilitate mutual learning and exchange of experiences and practices among Member States. This MLE concentrates on four specific kinds of procurement, namely:

- Direct innovation procurement
- Catalytic innovation procurement
- Functional regular procurement
- Pre-Commercial Procurement (PCP)

"Innovation Related Procurement" is, in this report, and in the whole MLE, used as an over-riding umbrella term for all the four categories above. It should be noted that the MLE Chair (Charles Edquist) is of the opinion that the first three categories should be grouped under the heading "Innovation-enhancing procurement (IEP)". The acronyms IEP and PCP will sometimes be used in this report in the senses indicated. The categories used will be described in much more detail in section 3 below.

A central question for the whole MLE is: How can different kinds of public procurements solve or mitigate societal and environmental problems by realizing

and enhancing innovations (in the case of IEP) or targeted research (in the case of PCP)?

The four subtopics of this MLE are:
Topic A: To contribute to creating strategic frameworks for the different kinds of Innovation Related Procurement, together with national strategies and action plans for promoting Innovation Related Procurement. The frameworks should address definitions, goals and indicators, tools and activities as well as roles and responsibilities of actors involved.

Topic B: To analyse the need for capacity building, raising awareness on innovation related procurement and offering support to contracting authorities.

Topic C: To investigate the required financial mechanisms for contracting authorities to undertake Innovation related procurement.

Topic D: To develop a monitoring, evaluation, and impact assessment system of Innovation related procurement in the Member States and in the EU. This might include proposals of new indicators on (different kinds of) innovation related procurement within the Community Innovation Survey (CIS) and the Innovation Union Scoreboard, thereby accelerating the setting of adequate numerical targets.

This report addresses issues related to strategic frameworks for innovation related procurement. It is based upon:

- Earlier literature in the field,
- Earlier policy practices in the field discussed at the MLE metings,
- The conceptual specifications in the Modus Operandi of the MLE,
- Issues and questions on this subtopic raised by the Member State representatives at the Kick–off meeting in Brussels on January 19, 2017.
- A background paper (by Charles Edquist) presented at a seminar on the development of strategic frameworks discussed at the MLE seminar on the same topic in The Hague on March 23, 2017.
- The comments on the background paper by the other members of the expert team for this MLE (Jon Mikel Zabala-Iturriagagoitia, Eva Buchinger and Gaynor Whyles).
- Comments and supplements on the background paper has also been available from all the Member States representatives in this MLE**.**
- Additional presentations, discussions and minutes from the seminar in The Hague and comments sent to the author by the fellow experts and by seminar participants (Member State representatives) after that seminar. Most of the Member State representatives provided supplements and comments, many of them detailed ones. In addition, Xavier Vanden-Bosch, Anne Mungersdorff and Lieve Bos provided useful comments on earlier drafts.
- Jari Romanainen and Viola Peter of the Technopolis Group have proposed excellent improvements, when performing the quality control of this report.

2 Issues and questions on strategic frameworks

At the Kick-off meeting, there was emphasis on which organisations are doing what with regard to the different kinds of procurement in the various countries.

- Is there a central ministry or public agency that actually carries out procurement on behalf of all other, more specialized agencies with regard to certain kinds of products?
- Or are the agencies that actually will use the products carrying out the procurements themselves?
- Is there a public agency that supports all other agencies in their procurement activities?
- Is there an agency that makes sure that procurement rules are followed?
- How are all these agencies coordinated?
- What are the relations between procuring agencies at the national, regional and local levels? Is there fragmentation?

There were discussions about the extent (quantitatively) to which the four kinds of procurements (see section 3) are carried out in the Member States.

There were discussions (and disagreements) about the relations between the roles of elected politicians, policy-makers, top management of procuring agencies and administrators who are actually carrying out the procurements – with regard to influence, competence, risk aversion, etc.

Objectives of various kinds of procurement were discussed:

- Cost reduction,
- Innovation
- Meeting societal and environmental challenges
- Value for money
- Growth
- Jobs
- Problems and obstacles related to various kinds of procurement were discussed:
  - Weakening of public organisations.
  - Difficulties in identifying needs and problems.
  - Translating problems/needs into functions.
  - Lack of competence of certain kinds.
  - Perceived imbalance of downsize counterincentives (which are clear and obvious) and lacking or unclear upside incentives for procurers who consider pursuing IEP.
  - Risk aversion, including fear of breaking the EU set of procurement rules.
  - Lack of interactive learning and procurement rules.

Finally, an important aspect for the framework concerns the time perspective: since long term planning and forward commitment are important for the suppliers, the required/expected needs should be specified one to two years before the actual functional procurement.

3 The kinds of public procurement addressed

A central question for this MLE is how innovations can be achieved by means of public procurement. Hence, it must be possible to distinguish between public procurement that

leads to innovation and that does not. Therefore it is absolutely necessary for the pursuit of this project that it is specified what innovations are. Innovations are defined here as new creations of economic or societal importance, usually performed by firms. Innovations can be new or improved products or processes.[1] New products (product innovations) may be material goods or intangible services; it is a question of what is produced. New processes (process innovations) may be technological or organizational; here, it is a question of how the products are produced. Of great importance, however, is that the new creations do not become (successful) innovations until they are actually commercialized or diffused (i.e. spread) to a considerable degree; the end-products have to be deployed in commercial volumes. The development of a prototype or a test series are not enough for research results to qualify as innovations. New creations that are not commercialized or diffused in other ways are not innovations.[2]

One of the roles of innovation policy is to create the conditions and incentives for the systematic emergence, development and diffusion of innovations that help address and respond to socioeconomic and environmental needs, both now and in the future. Innovation Enhancing Procurement (IEP) are instruments that can help achieve this goal. IEP constitutes demand-oriented initiatives and policy instruments related to innovations.

Before discussing which are the key issues that should be considered within a strategic framework for innovation related procurement, it is crucial to know which kinds of public procurement that are addressed in this MLE, in order to design strategies about how they can be increasingly (or less) used. Four kinds of procurement are addressed in this MLE:

1. Direct innovation procurement
2. Catalytic innovation procurement
3. Functional regular procurement
4. Pre-Commercial Procurement (PCP)

”Innovation Related Procurement” is, in this report, and in the whole MLE, used as an over-riding umbrella term for all the four categories above. Categories 1-3 have a different flavour and are termed ”Innovation-enhancing procurement (IEP)", since they may directly influence innovation. The acronyms IEP and PCP will sometimes be used in this thematic report in these senses, indicating that PCP is not innovation-enhancing public procurement in the sense of procurement of products (but instead procurement of R&D results). Hence, the concept ”Innovation-enhancing procurement” is a much wider term than the old concept of ”public procurement of innovation - PPI”, since it includes ”functional regular procurement”. However, it excludes PCP, for obvious reasons.

The four kinds of procurement addressed here can be specified in a fairly detailed manner:

- *Public innovation procurement* takes place when a public agency or unit prepares and places an order for a product to fulfil certain functions within a given time period, but for which a product does not exist at the time of the order. The purpose is to satisfy unmet societal or environmental needs or to mitigate what is often called global challenges – but which are often national or local at the same time. This type of procurement *must* result in some form of product innovation before delivery can occur (although the product can be used as a process). Product development is needed, but not necessarily R&D. Public innovation procurement must result in innovation and delivery of a more advanced product. In other words, public innovation procurement is always innovation-enhancing (if not failing altogether).

[1] I include here what the European Commission calls ”a service” and ”a work”.

[2] This definition is based upon the OECD Oslo Manual (OECD/Eurostat, 2005). This manual is the standard basis for work on innovation within the OECD and the EU – and elsewhere.

  - The sub-category *direct public innovation procurement* occurs when the procuring authority/unit is also the (end) user of the product that is planned to result from the procurement. The procuring agency uses its own demand or need to promote an innovation. This is the "classical" case.[3]
  - The sub-category *catalytic public innovation procurement* occurs when the procuring public agency functions as a catalyst, part-financier, and/or knowledge resource for the (end) users, which are represented by a "purchase group". [4]

- *Functional regular procurement* can be defined as the procurement of products by an authority/unit that describes a function to be performed or a problem to be solved (functional specification) instead of describing the product that is to perform the function. In functional procurement, a public agency specifies *what* is to be achieved rather than *how* it is to be achieved. Hence, it is a matter of the *manner* in which a procurement call is set up and the tender documentation is formulated. It might lead to innovations or it might not.[5] In other words, functional regular procurement is innovation-enhancing in the sense that it opens up for innovations, but it does not require innovations. (At the same time, the risk of failure is smaller – see below.)

- *Pre-Commercial Procurement (PCP)* takes place when an expected R&D result or solution is procured by a public agency, i.e., it implies direct public R&D investments (or R&D subsidies). PCP is an approach to procuring R&D services, which involves risk and benefit sharing and does not constitute state aid. Commercialization is not allowed to be part of the PCP process according to the WTO/GPA and EU regulations. PCP is exempted from a large part of the EU procurement rules.[6] "*Pre-Commercial Procurement (PCP) means the procurement of research and development services…… where there is a clear separation of the research and development services procured from the deployment of commercial volumes of end products*" (REGULATION (EU) 2013; also quoted in Note to ERAC 2016: footnote 2). In other words, the buying of end-products in commercial volumes is not included in PCP. In this sense, PCP is not procurement of innovations (but of R&D), although it can precede innovation - and thereby influence innovation processes from the supply side, but not from the demand side. So do many other determinants of innovation, which we do not call innovation procurement (Edquist 2005).

This typology and the categories included are by no means a list of "procurement procedures" in the legal (EU Directive) sense of the word. As a matter of fact this is not a report about such procedures at all and they are mentioned only in passing in a few places. That includes the new procedure "innovation partnership" (see section 6.6). There is no systematic discussion of such procedures in this report. Instead this report is dealing with matters of susbtance with regard to innovation related public procurement.

The four kinds of public procurement listed above should not be mixed. They are *different*; they have different *goals* and are implemented in different *ways* by means of policy. A clear terminology and understanding of the differences and commonalities will help the relevant procurement enhancing policies to foster innovation. A clear understanding will

[3] Direct innovation procurement has long been practiced in Sweden and other countries. Several examples are described and analysed in Edquist et al. (2000), Edquist and Zabala-Iturriagagoitia (2012) and Edquist et al. (2015). In Sweden, such procurement has led to tens of thousands of jobs and billions of Euros in export incomes.

[4] This concept as specified here was first formulated in (Edquist and Hommen, 1999) and further developed in (Edquist et al., 2000). There are different definitions of catalytic public innovation procurement around (e.g. in the Dutch SBIR Program), which are not considered here. Sweden has had a long and successful experience of catalytic innovation procurement by carrying out 60 catalytic procurements to date, for example the procurement of a refrigerator not using any freon and using only half the amount of electricity compared to existing ones.

[5] The perspective on functional procurement has been developed in Edquist (2014, 2015 and 2016). Note that the EU procurement directives also stress the importance of functional procurement for innovation. This will be discussed in more detail in section 5.1.

[6] See Edquist and Zabala-Iturriagagoitia (2015) for a much more profound discussion of PCP.

also support the mutual learning between EU Member States. Finally, the differences need to be integrated in the strategic frameworks. It is therefore necessary to have separate and clear terms/concepts for the four different specific kinds of procurement. For the purpose of understanding public procurement and pursuing procurement policy to enhance innovation, the four specific kinds of procurement are the important ones, not an overarching category.

It is therefore important to stick to using the four specific categories as much as possible in this MLE. The strategic frameworks will partly be different for the four types of procurement addressed. One may need to add further types innovation-related procurement if they have a bearing on innovation and can be separated from each other.

Naturally, the four categories of procurement can be used and combined with each other (and with other innovation policy instruments) in a complementary manner within an instrument mix, as they all contribute to the ultimate goal of innovation policy (i.e. to create the conditions and incentives for the systematic emergence, development and diffusion of innovations).[7] Hence, it is important to define the concepts/categories precisely and separate them, instead of lumping them together. For analysts, it is important for concepts to be defined precisely so that the phenomena they denote can be clearly understood. There is certainly a difference if innovations are required or not in a procurement. And there are also differences if the results wanted are innovations (new products that are commercialized) or if one wants R&D results. For policy makers, clear concepts are important for deciding what they should do, e.g., which goals to set for a certain type of procurement, i.e., what is to be procured and how the procurement is to be conducted. For example, the different kinds of procurement are subject to partly different regulations.

4 The importance of functional specification for innovation

In this section it will be argued that explaining and defining functional specifications rather than traditional descriptions of product/process characteristics is the key to all innovation-enhancing procurement (the first three categories in section 3). Hence "functional specifications" and "functional procurement" will be focussed here.

Innovations may, of course, sometimes occur in regular *product procurement,* even if it was not a requirement of the procurement - if the product description is generic enough to include innovations (better products) that emerge anyway. ("Product procurement" is when the procuring part describes the desired product and its characteristics in the tender documentation.) One of the roles of innovation policy is, however, to create conditions and incentives for the systematic emergence and development of innovations that help address and respond to socioeconomic and environmental needs, both in the present times and in the future. Innovations may be very much facilitated by *functional specifications* [8] (as compared to product specifications).

Functional procurement can be defined as the procurement of products by an authority/unit that describes *a function to be performed (or a problem to be solved) instead of describing the product that is to perform the function*. In functional procurement, a public agency specifies *what* is to be achieved rather than *how* it is to be achieved. Functional regular procurement is pursued by means of functional specifications instead of product specifications. Hence, it is a matter of the *manner* in which a procurement call is set up and the tender documentation is formulated. Needs are translated into functions to which potential suppliers can respond. Needs are accurately identified and presented as requirements in terms that suppliers can respond to. It *opens up* for innovation but does not *require* it. Innovations are not excluded or disadvantaged. However, it should also be

[7] How different innovation policy instruments are combined in instrument mixes is analysed in Borrás and Edquist (2013).

[8] The perspective on functional procurement has been developed in Edquist (2014c, 2015b, 2016a, and 2016b).

noted that a functional tender requires a process by which the need is identified, accurately specified and that potential suppliers are informed and engaged prior to the formal (functional) tender.[9]

A pre-existing product can still be procured (if it fulfils the - functional - specifications). Therefore, functional procurement does not (necessarily) mean that an innovation results from the procurement. Since an innovation is *not required* in functional procurement, the risk of failure is smaller with functional procurement than with (direct or catalytic) innovation procurement (which also requires functional procurement, see section 6.5). The risk is smaller – or zero - in the sense that the lack of an achievement of an innovation was not required. The risk is also smaller in the sense that the pre-existing product can always be procured.

In short, the category "functional regular procurement" is, of course, regular procurement (since it may result in the continued procurement of existing products - if no better products come forward). But it also allows for the procurement of new products (innovations), thanks to the functional specification. [10] Functional regular procurement can be considered to have the largest potential for innovation of the four categories of innovation related procurement addressed here.

However functional specifications is much more important for innovation than that. In passing, it has been mentioned that *public innovation procurement* (direct as well as catalytic) must also be pursued by means of functional specifications. Product procurement/specification is not possible in this case since an innovation (commonly a new product) is required and it is not possible to describe a non-existing product.

The same is actually true for Pre-commercial Procurement (PCP). PCP is a matter of buying research results that solve certain problems. These research results are not known and cannot be described ex ante – which implies that PCP normally is a matter of functional specifications (of research results).

The general conclusion is that functional specification is needed for all the four different kinds of procurement addressed in this MLE.

A common belief is that private firms are often open to innovation when they buy from each other – and that they often require improved products, i.e. product innovations, or they use functional specifications. Public procurers do so more rarely (Edquist 2014c). This means that both they and their suppliers are left behind. *To achieve innovation through public procurement it is, somewhat paradoxically, more important to emphasize functional specification than to pursue innovation procurement*

Functional specifications opens up for innovations in *all* types of public procurements - not only those requiring innovations (i.e. innovation procurement).

Box 1 The Swedish national procurement strategy

The importance of functional procurement and functional specification motivates an account of an example of a Member State that is pursuing functional regular procurement in its National Public Procurement Strategy. [11] This project is a mutual learning experience on innovation related procurement.

[9] In this regard, and according to the European directives on public procurement, there are different "procurement procedures" through which public procurement initiatives can be undertaken which allow that dialogues can be pursued in early stages. Examples are open, restricted and negotiated procedures, competitive dialogues and design contests.

[10] Obviously, functional public procurement can take the form of regular procurement or lead to innovations. (Direct or catalytic) innovation procurement is, however, always functional procurement. Product procurement can only be regular procurement. The notion of "innovation-friendly procurement" is also around. It is, however, a rather vague term.

[11] Another example of functional procurement, also worth mentioning, and which was presented in The Hague meeting is the Norwegian one. In it, four types of requirements are identified: performance-based, functional-

Sweden *is the only country where the government has developed a national strategy for public procurement where innovation procurement - actually meaning functional procurement - is central. The government took a decision on that strategy in June 2016. It is now in the process of being implemented. All other EU Member States have more to learn from Sweden in this respect than from any other country.*

To systematically use functional procurement as an innovation policy instrument may be under way in Sweden. After the election in September 2014, the new Prime Minister (Stefan Löfven) appointed a Minister for Public Administration for whom the responsibility for public procurement is a very important duty. From September 2015, this Minister (Ardalan Shekarabi) created a new separate public agency for "procurement support", with support to innovation-enhancing procurement as an important task: the National Agency for Public Procurement (further discussed in sections 5.2. and 6.4. below). A National Public Procurement Strategy was simultaneously being formulated by Ardalan Shekarabi during the first half of 2016. This was done in close collaboration with the Swedish National Innovation Council, chaired by the Prime Minister.

The Swedish government collectively took a decision to adopt the National Public Procurement Strategy on June, 30, 2016. Functional procurement is an important element in that strategy (Regeringskansliet 2016).[12] *One of seven parts of the strategy has the title "Public procurement that enhances innovations and alternative solutions". The following are quotes from this part:*

- *"There is a large potential in using procurement as an instrument to enhance development and innovation."*
- *"The public sector can also enhance innovation in suppliers by, in procurement, demand functions rather than ready solutions."*
- *"By requiring functions instead of having specific requirements with regard to goods and services, the creativity and ability to innovate of the potential suppliers are enhanced."*
- *"To demand functions can increase competition in the procurement, since a larger number of firms and organisations can respond to the tenders, which is beneficial particularly for small and medium-sized firms."*
- *"… your agency formulates functional requirements and emphasizes the result that shall be achieved instead of specific requirements with regard to the goods and services."*
- *"… your agency uses assistance from the initiatives and means of support that The National Agency for Public Procurement has developed to formulate functional requirements in procurement." (Regeringskansliet 2016: 18-19)*

The fact that functional public procurement is an important part of the National Public Procurement Strategy will not mean any substantial new direct costs (except for education and training and some increased transaction costs) in the public budget.[13] *It will be an alternative way of using the funds that are already allocated to public procurement. If 10% of the 700 billion crowns used for public procurement will stimulate innovation in the future, this corresponds to 70 billion crowns (8 billion euros). The public annual research budget is 35 billion crowns (4 billion euros). Hence, the application of this new strategy has great potential to increase the resources that will be used to obtain products with a higher quality (innovations). This, in turn, could lead to better needs satisfaction and/or problem solving and lower costs in the long run.*

The main reason for this proposal is that its implementation would release enormous creativity and innovativeness among suppliers – and for the public sector - within a very large proportion of the economy as a whole. The proposed approach would also lead to increased competition, not only among different potential suppliers of similar products, but also among radically different products that solve the same problem. All this leads to a higher quality of the public services (i.e. to innovations in the public sector). Functional public procurement has thus the largest potential to enhance innovations of all kinds of public procurement. This potential has, so far, been harvested to a very limited degree (Edquist, 2017).[14] *Estimates of the (small) quantity of*

based, standard and detailed (i.e. technical) specifications. Additional examples are briefly presented in Appendix I.

[12] In the part enhancing innovation in the Swedish National Procurement Strategy, the strongest emphasis is put on functional procurement. Pre-Commercial Procurement (PCP) plays no longer any role in the new strategy of Sweden. PCP was previously supported by VINNOVA, the Swedish public innovation agency.

[13] However, as will be argued, the societal benefits may be enormous.

[14] It is, of course, also very important that other restrictive conditions than product descriptions, that prevent small or innovative firms from submitting bids, are not included in the calls for tenders. At Region Skåne, which is a very advanced procuring organization in the Skåne Region in Sweden, Louise Strand (Director of

functional procurement in Sweden are presented in (Edquist 2014c). The small quantity indicates that there is a huge unleashed potential.

The implementation of the Swedish National Procurement Strategy started after the summer 2016. The Swedish government has given the task to the Agency for Public Procurement (Upphandlingsmyndigheten, UHM). In December 2016, the Swedish government also gave an assignment to UHM to enhance innovation procurement by giving support to "procurement groups" ('beställargrupper') to be formed by procuring agencies at a national, regional and local level that have similar needs for innovative solutions (i.e. bundling of demand). The General Director of UHM (Inger Ek) said in a conference organized by UHM on November 21, 2016 that they are pushing functional procurement.[15] At the same conference, the minister in charge (Ardalan Shekarabi) said that all public state agencies have been given instructions to pursue IEP. The General Director has also said in an interview in the biggest Swedish Economics newspaper that "We want to open up for innovation and new ideas by means of buying function instead of product." (Ek, Inger 2017: page 1) This is very promising, if enough competence and resources are recruited, mobilized and allocated for this purpose. It may be noted that the statement by Inger Ek is quite similar to the argument just above Box 1 that it is more important to emphasize functional procurement than to pursue innovation procurement if the objective is to achieve innovation by means of public pocurement.

If the implementation process continues well, Sweden will be the first country to systematically use functional regular public procurement as an innovation policy instrument. As a result of these recent changes, functional public procurement may develop into the most important instrument in Swedish innovation policy. Since this instrument operates from the demand-side, it constitutes a supplement to research policy and other instruments that drive innovation from the supply side. It could thereby be an important element in transforming Swedish innovation policy from a linear to a holistic one, and thereby making it more efficient.[16]

A new EU directive came in 2014, and it is quoted in section 5.1, below. That Directive clearly says that functional specifications can be used, that it is a means to favor innovation (in addition to competition) and that functional specification should be used as widely as possible.

5 The set-up of organisations and institutions to pursue innovation related procurement

Public procurement is, by definition, products procured by public organisations at the national, regional and local levels. However, also other organisations than these must be parts of strategic frameworks that enhance innovation related procurement. So must various kinds of institutions.[17] This section addresses a huge topic and will be focussed on parts of the relevant institutions and organisations – and can deal with them only superficially.

procurement) calls this an "innovation friendly washing machine". Restrictive clauses might concern requirements of reference deals, size of the company, size of the tender, restrictive IPR conditions, disproportionate financial and technical guarantees from tenderers, etc.

[15] In the fall of 2016 UHM published, at its home page, detailed descriptions of 7 cases of functional procurement, to serve as role models. There are many additional cases of functional regular procurement in Sweden. Two examples are the procurements of 'wound care' (instead of bandages) and plastic aprons for surgery pursued by the health care part of the 'Skåne Region'. Many previously unrecorded cases have also 'emerged' when the issue has started to be publicly discussed in Sweden. It is likely that cases exist also in other countries. They may "emerge" within this Mutual Learning Exercise.

[16] A holistic innovation policy has been addressed in Edquist (2014b), (2014d) (2014e), (2015a),(2016a), (2016b).

[17] As indicated below, I make a clear distinctions between "institutions" and "organizations". These concepts, and the relations between them, are discussed at depth in Edquist and Johnson (1997). To study the relations between them, they must be conceptually distinguished from each other. For Nelson and Rosenberg (1993), "institutions" are the same as different kinds of "organizations" ("players"), while the term "institution" primarily means "the rules of the game" for (Lundvall, 1992). Hence, the term "institution" is used in different senses in the literature and they are often not clearly distinguished from each other.

To provide some specificity, the discussion will be illustrated by examples of various institutions and organisations that have been created in Sweden. The idea is, however, that this MLE shall serve as an operator for comparing the set-ups of institutions and organisations in various Member States. This might lead, as a result of benchmarking between participating Member States, to the identification of some solutions that are better than others – in a process of mutual learning. As a result, it is expected that one of the outcomes of this MLE will be the identification of good practices in similar organizational and institutional settings, so the different Member States can learn from each other. However, due to the diversity of organizational structures, institutional settings, governance mechanisms and profiles and capabilities in the Member States, it is not possible here to provide an individual benchmark for every country, given the number of dimensions (and their particularities thereof) that are to be considered within the MLE.[18]

5.1 Institutions

Institutions are laws, rules, regulations, routines and habits that influence, for example, innovating organisations and innovation processes by, for example, providing incentives for and removing obstacles to innovation – or constituting obstacles. Key institutions in innovation systems[19] are competition regulations, patent laws, national laws and rules that govern the relations between companies and universities, rules governing the approval of drugs, rules and laws governing public procurement, environment and safety regulations, cultural norms, etc. Institutions are the rules of the game.

The European Commission provides procurement rules in the form of directives, which are translated into national laws by Member states. The process is not ratification, but Member states are mandated to adopt the rules described in the directive in their national legislation (not necessarily word for word, but national changes can be made as long as they are not in conflict with the directive). The directives are applicable for all kinds of public procurement, including the three kinds of innovation-enhancing procurement (IEP) discussed here. However, they are not valid for Pre-Commercial Procurement (PCP) which is governed by other EU rules.[20] These procurement rules are very complicated and it is often said that they should be simplified (Edquist and Zabala-Iturriagagoitia (2012). They will not be dealt with in any detail in this report, but will be addressed briefly again in section 6.6. However, as it has already been discussed in the relation to the formulation of functional requirements in the procurement directives, it must be mentioned that the tender documents, according to the procurement law, can be formulated in functional terms as well as in terms of product specifications – see just below.

”Functional (regular) procurement” is not one of the so-called “procurement procedures” in the EU regulatory framework for public procurement specified in the legislation, which has to be followed by all EU Member States. This is a legal fact and cannot be changed in the short term. Functional procurement/specification *is* not a procurement procedure. Despite this, functional procurement is *necessary* in all innovation procurement, direct as well as catalytic. It can simply apply functional (or performance) specifications in the tender documentation for the procurement. Several of the existing “procurement procedures” can be used for this purpose.

The concept “functional demand” *is* found in the EU and national legislations, such as the Swedish one. The procurer may thus choose to describe a function *or* a product in the tender specifications. There are actually no limits to this and *”functional demands” can*

[18] An overview of individual countries has been done by Anne Mungersdorff in Annex I of OECD (2016).

[19] The innovation systems approach has been addressed in Bergek et al (2008), Braczyk (1998), Breschi and Malerba (1997) Carlsson (1995), Cooke (2001), Cooke et al (1997), Edquist (1997), Edquist (2005), Edquist (2011), Edquist (2014a), Freeman (1987), Lundvall (1992), Nelson (1993).

[20] Making use of the exemption of the Article 16(f) old directive 2004/18/EC and recital (47) the new Directive 2014/24/EU. The latter EU Directive refers to Pre-commercial Procurement “which deals with the procurement of those R&D services not falling within the scope of this Directive.”

always be used in the tender specifications, without changing any laws or rules. [21] It is highly relevant to point this out, since it was strongly argued that functional demands could not be used in public procurement at the time of the publication of Edquist (2014b).

The EU procurement directives on public procurement are very important for all procurement in the European Union. In the new Directive 2014/24/EU of 26 February 2014 it is written:

"The technical specifications drawn up by public purchasers need to allow public procurement to be open to competition as well as to achieve objectives of sustainability. To that end, it should be possible to submit tenders that reflect the diversity of technical solutions standards and technical specifications in the market place, including those drawn up on the basis of performance criteria linked to the life cycle and the sustainability of the production process of the works, supplies and services.

Consequently, technical specifications should be drafted in such a way as to avoid artificially narrowing down competition through requirements that favour a specific economic operator by mirroring key characteristics of the supplies, services or works habitually offered by the economic operator. **Drawing up the technical specifications in terms of functional and performance requirements generally allows that objective to be achieved in the best way possible. Functional and performance-related requirements are also appropriate means to favour innovation in public procurement and should be used as widely as possible.**" (EU 2014: Recital 74 – extra bold type added by the author)

It is remarkable that the EU Directives so strongly stresses functional requirements, and that they emphasize that they "should be used as widely as possible" to favour innovation (and competition) in public procurement. The rationale is to avoid favouring specific companies by defining the requirements too narrowly. There is actually a large number of case law dealing with these kinds of cases, which highlights the problem. Luckily, this emphasis also favours innovation, although it may only be the secondary reason for emphasising this approach. In other words, the use of functional requirements in public procurement not only supports innovation, but also serves as a powerful instrument of competition policy. The mechanism is that opening up for competition between different products to satisfy the same need or solve the same problem is an important means of increasing competition.

There are also "informal" institutions that influence public procurement and the degree to which public procurement can be pursued to enhance innovations. They may be routines and cultural norms. Contracting authorities may develop their own internal procurement rules of how to buy on top of the requirements of the EU Directives.

A large number of regular public procurements are perfunctorily conducted, i.e. the procuring agency or unit describes the same product as in previous procurements in a routine manner (i.e. path dependency and inertias) (Edquist 2014c). I have previously called this "product procurement". These products must obviously be existing ones, since they can be described by the procuring organization. They may even be obsolete. If that is the case, qualitatively superior, products (i.e. innovations) may be excluded in the procurement process. A routine of simply describing the previously procured products makes it difficult or impossible for new products (innovations) to be accepted. This is a major obstacle to innovation. You get what you ask for – even if it is an obsolete product. It would be very important to better, and in detail, understand the underlying reasons for this behaviour. It would, for example, be very important in an attempt to try to change

[21] Preliminarily, I consider performance and functional demands as synonymous in the text quoted, which means that functional procurement is possible also with "performance requirements" – e.g. the tender can specify a certain amount of energy reduction relative to the best available technology without specifying how this energy reduction is to be achieved. In other words, a performance requirement as the one here is the same as a functional requirement.

this behaviour. I will further discuss this issue as an obstacle to innovations in procurement processes in section 6.4.

Risk aversion is another routine or cultural norm that might inhibit Innovation-Enhancing Procurement (IEP) or PCP. This issue will be discussed in section 6.5 below.

5.2 Organisations

Organisations are formal structures (e.g. hierarchies) that are consciously created and have an explicit purpose. *Organisations are actors or "players".* Examples include companies, universities, various public organisations at the local, regional, national and supranational levels, policy organisations, etc. Organisations may influence institutions and they may be influenced by them. Institutions may also be external as well as internal to organisations. (Edquist and Jonson 1997)

In the discussions held at both the MLE Kick-off meeting and The Hague meeting, there was emphasis on which organisations are doing what with regard to different kinds of procurement in various Member States.

It has already been mentioned that public procurement is, by definition, products procured by public organisations at the national, regional and local levels. Several other organisations are also necessary in strategic frameworks for the pursuit of IEP and PCP. As will be argued, different kinds of organisations are sometimes needed for different kinds of procurement – just as different kinds of institutions may constitute incentives or obstacles to innovations by means of procurement in various ways.

In direct innovation procurement and functional regular procurement, the organization that will use the product is also pursuing the process of procuring the innovations. In catalytic innovation procurement, several other kinds of organisations are also involved – as catalysts, part-financiers or knowledge resources for the (end) users. These three kinds of Innovation-Enhancing Procurement (IEP) are, as mentioned before, functional kinds of procurement. In Pre-Commercial Procurement (PCP) the financing organisations are often research-funding organisations (such as the Swedish VINNOVA and, in Norway, the Research Council of Norway RCN), which are normally not the end-users of the R&D services procured. The end-users are those organisations that may have applied for funding to, for example VINNOVA, and pursue the PCP projects. This indicates that the four kinds of procurement addressed in this MLE need different organizational set-ups.

In many Member States, there is a central ministry or state agency that actually carries out procurement on behalf of all other, more specialized (user) agencies for certain kinds of products, e.g. "framework procurements" of computers. During the MLE workshop several cases were evoked by participants. For example, in **Austria**, a central purchasing body exists (BBG – Federal Procurement Agency). BBG is a state-owned agency providing free services to their mandatory clients. Federal organisations are obliged to order from BBG contracts – unless they are able to obtain the same product at better conditions. Other public sector organisations such as universities, communities, states, state-owned organisations or health organisations may take advantage of BBR's contracts and services for a modest fee.[22] In **Norway**, the newly erected Central State Procurement Centre at DIFI[23] and the Procurement Centre for State Hospitals (HF Sykehusinnkjøp[24]) for the state owned hospitals in Norway, both started operations in 2017. They both deal mainly in centralised framework contracts which the individual state procurers can make use of. In **Germany**, municipalities may use the central purchase under the Ministry of the Interior although few use this possibility. For **Latvia**, several central purchasing bodies exist, whose use is encouraged to bundle demand. In other cases, like **Estonia** or **the Netherlands**,

[22] http://www.bbg.gv.at/english/about-the-fpa/

[23] See here, in english: https://www.anskaffelser.no/public-procurement-information-english

[24] See here: http://sykehusinnkjop.no/om-oss/

central purchases are rather the exception, although there is much effort in rationalizing the purchases into joint-procurement across organizational layers.

Centralised solutions may mean getting lower prices by exploiting economies of scale, but it also means that the "distance" between organisations (the procuring agency and the final user of the product) is large. Such a large distance may be problematic for the formulation of the tender specifications, since the specific knowledge about the problems to be solved in the procurement might be less well known at a distance. Getting involved in early dialogues with potential suppliers before the official launching of procurement calls may, in these cases, be important. Also within large organisations that are both handling the procurement process and actually use the resulting products, such a "distance" can be fairly large. For example, a large public health care organization normally has a procurement sub-unit inside its organization. Individuals in that unit may not have profound knowledge about, for example, different kind of X-ray investigations which doctors need. Close collaboration and interactive learning between medical personnel and procurement administrators is then crucial in procurement.[25]

At the MLE Workshop on strategic frameworks for innovation related procurement (The Hague on March 23, 2017), the Member State representatives gave each a short overview of the situation in their country (see Annex I for a summary and more detail). More or less all Member States use agencies for giving advice, running programs and providing financing in relation to public procurement.

It was reported by the Member State representatives that the ministries in charge are different ones in different countries. It may be the Ministry of Finance, the Ministry of Industry and Trade, the Ministry of Economy, the Ministry of Innovation, etc. Or every public body may be responsible for their own procurement. Sometimes the organization of the procurement is centralised and coordinated, sometimes every organization purchases for itself, at the municipality, the regional, the national and the federal level. In some Member States several ministries are involved. This means that coordination between ministries is an issue in many (but not all) Member States.

In some countries, the central government can heavily influence the procurement of local and regional agencies. In some countries (e.g. NL, DE), agencies at three levels (national, regional, municipal) are responsible for their own procurement, and regions and municipalities may be independent from the national level, such as in Sweden and the Netherlands. Therefore, the "National Strategy for Public Procurement" that was decided upon by the Swedish Government in June 2016 (discussed in section 4), cannot be forced upon regional and local administrations. However, the national strategy can serve as an example inspiring new initiatives in procurement in local and regional administrations. In the Swedish case, this strategy will probably lead to a larger proportion of functional procurement at the national level, but also at local and regional levels, if the strategy is properly implemented.

If new kinds of procurement are to be carried out in new ways, e.g. if public procurement shall enhance innovation in the way discussed in this MLE, then there is a need for new knowledge about how to pursue this. [26] This knowledge should be made available to all organisations pursuing, or involved in, IEP or PCP - or, more specifically, to the procurement administrators in the country.[27] In Sweden, there is a public agency called The National Procurement Agency ("Upphandlingsmyndigheten" - UHM) which has the task

[25] Interactive learning is important in all kinds of innovation enhancing procurement, just like in most kinds of innovation processes. It will be further discussed in section 6.6.

[26] This new knowledge implies getting more evidence on incentives, tender formulation, potential participants, how to have early market dialogues, how to finance the different initiatives, how to monitor, how to evaluate, how to assess the impact, how to increase or build capacities, how to mix IEP with other policy instruments, knowledge about the barriers to IEP implementation, the roles played by the state in the formulation of long term strategies IEP can help with, etc.

[27] In Sweden, with a population of 10 million, there are about 5 000 procurement administrators.

of supporting all units pursuing public procurement (see sections 4 and 6.4). In the new National Procurement Strategy for Sweden, UHM has been given the task of providing special support by taking initiatives and provide support to formulate functional specifications in public procurement. When an existing organization with existing personnel and given competencies is given new tasks, there is always a danger that the new tasks are less focused, due to organizational inertia and resistance to change. It then becomes an issue for the leadership of the agency.

Also, new knowledge on how to carry out procurement has been developed in Spain to conduct and guide proposals of IEP that have been pre-financed by the Spanish Ministry of Economy to be finally financed for FEDER – ESIF. The coordination between various Innovation Procurement Competence Centres working as a network lead by the Ministry of Economy has allowed the participants to learn from the best practices defined by the first participants in health issues, with EIP projects that have been coordinated and assessed by the Ministry of Health and by the Health Institute Carlos III.

In the creation of the rules (institutions) for procurement, several kinds of organisations are needed: the European Commission, the European Parliament, The National Parliaments, as well as the governments, and state apparatuses in Member States are involved. Some countries also have a separate public body with the main task to secure that the national rules and directives are not violated (in Sweden it is called The Competition Agency). There must also be an administrative court or complaints authority to which bidders in tenders can complain when they feel that they have been unfairly treated in a public procurement.

At the meeting in the Hague there were discussions about the relations between the roles of elected politicians, policy-makers, top management of procuring agencies, accountants and administrators who are actually carrying out the procurements – with regard to influence, competence, risk aversion, etc. Participants discussed the risk when translating from the political layer to the administrative layer. Politicians may have a will to boost innovation, but the risk of implementation (loose effectiveness) is high due to the fact that it falls under the responsibility of the administrative layer, which is more concerned with following rules than boosting innovation.

The relations between politicians, policy-makers and administrators is related to the question of whether there is an explicit strategy with regard to enhancing innovation in public procurement.

There are such explicit strategies in some Member States, but not in most (see Annex 1). The MLE Chair suggests that the following should/could be included in such strategies:

- What kinds of procurement are emphasized to enhance innovation?
- Who implements these priorities?
- Who creates the rules (in addition to the law)?
- Which organisations implement the strategy? Which ones monitor and evaluate it?
- What capabilities are required in these organisations? This certainly depends on the roles they are supposed to play.
- Who assesses the needs for capacity building?
- Who (if anyone) sets aside budgets for IEP and PCP?
- Is financial support for either facilitating IEP procedures, or for paying for the procurement of innovations itself needed - from which agency/agencies shall it come?

One of the main barriers or potential ways to enhance innovation related procurement is the governance system related to internal allocation of public funds, i.e. under what kinds of contracts is money allocated from national/regional/local budgets to public organisations to carry out their mission. If this money is under performance contract focusing on short term goals, it is not likely to encourage innovation related procurement (even functional regular procurement). However, if the contract has and/or requires ambitious longer-term performance improvements – and perhaps offers additional resources to reach for them – the situation is very different. This is an issue that should somehow be discussed in further detail as it is often one of the main barriers.

The description above indicates that the set-up of institutions and organisations needed for pursuing public procurement in a way that can enhance innovation may be quite complicated, and there may be fragmentation. Participants in the MLE discussed the inefficiencies caused by too much dispersion when there are many organisations (agencies) involved. This indicates, in turn, that issues of coordination may be crucial. Different institutions may be inconsistent with each other and there might be problems of coordination, and even infighting, among different organisations. At this stage of the MLE, there is hence still much room for better learning how the set-up of institutions and organisations in one country may be performing better than in another one.

6 Obstacles to innovation/functional procurement and ways of overcoming them

There are many obstacles to pursuing procurement in such a way that it leads to innovations – and in section 4, I argued that that, in principle, such procurement is always pursued as functional procurement. Some obstacles or challenges are:

- Weakening of public organisations
- Identification of needs/problems
- Specification of functions
- Competence-building in procurers and procurement support
- Risk/risk aversion, for example perceived imbalance between upsides and downsides for procurers/procuring entities
- Lack of measurement (to be analysed in another thematic Report within this MLE)
- Lack of interactive learning and the role of procurement rules

6.1 Weakening of public organisations

At a time when there were large direct public direct innovation procurements in Sweden, the procuring public organisations were strong and not governed by short-term considerations (e.g., quarterly reports). Organizations such as Vattenfall (electric power), Televerket (telecommunications) and SJ (railways) were able to have a long-term strategic vision. This has since changed. Televerket is now listed on the stock market and has a large proportion of private shareholders; in addition it has been merged with the previously Finnish state-owned monopoly to form Teliasonera. Vattenfall and SJ function pretty much as private enterprises. Obviously, some of them are no longer public organisations, subject to public procurement regulations, as they are private companies. This has weakened the public side.

This leaves only limited room of manoeuvre for public organisations in their use of resources to create the incentives and conditions for the emergence, development and diffusion of new products of increased quality and/or lower costs in the long term. Hence, the capacity of these public organisations to be strong procurement actors has been

considerably weakened. As a consequence, they tend to restrict themselves to regular "product procurement" of existing "off-the-shelf" products. (Edquist 2014c)

6.2 Identification of needs/problems

I have emphasized that the ultimate goal of public functional (and innovation) procurement is not primarily to support or stimulate the development of new products, but to focus on solving problems. *Needs* or *problems* must be the point of departure for every functional/innovation procurement. One should *never* practice "product procurement", i.e. start with the product or specify what it should look like. Needs assessment is crucial for all innovation enhancing public procurement – and for this MLE. This is a main obstacle to pursue functional procurement and considerable efforts should be made to understand the underlying reasons why it is difficult to identify needs and problems specifically enough to pursue functional procurement. Detailed methodologies for this need to be developed.

The most important task in preparing functional procurements is to identify the problems to be solved and the needs to be satisfied by means of the procurement. It is a question of *specifying* the *goals* (problems and needs). Developing an ability to identify needs, and problems and also evaluating the feasibility of proposed solutions are important. This might sometimes be quite difficult and may constitute an obstacle to Innovation-Enhancing Procurement.

During the specific session on the topic of functional specifications in The Hague, participants discussed potential issues. It was stressed that knowing what you want is not necessarily a trivial task for the procuring entity. It requires time and cooperation between departments which can be a barrier. Sometimes the supplier may not understand the need properly, which in turn leads to a contract not fulfilling the expressed need. It was evoked that detailed specifications can increase rather than decrease risk. Thinking in terms of what is needed rather than how the need is met requires a change in mind-set at the specification and the contract monitoring stage.

6.3 Specification of functions

Identified societal needs and problems must be translated and transformed into functional requirements. This specification of functions is an early stage of the procurement process, and comes directly after identification of needs and problems. This applies to direct and catalytic innovation procurement as well as to regular functional procurement and PCP. Function-specification may be a very simple task, as in the procurement of acceptable decibel levels in apartments close to a road or railway instead of describing a noise barrier.[28] In other cases it may be a complicated and at times demanding task.

Neither the detailed design nor the basic design of any product should be specified by the procuring authority/unit. It is important that the procuring authority/unit should limit itself to specifying the functional requirements. If not, the creativity and innovativeness of the potential suppliers will be hampered. It may also lead to development being locked into wasteful and ineffective paths. By the same token, too detailed functional specifications may also be an encumbrance for innovation. It may also be an obstacle to the simultaneous procurement of more than one attempt to meet the same functional demands, but in different ways. The products must be designed by the potential innovators/suppliers.

Let us present an example that will illustrate why the procuring authority/unit should not specify the product requirements. When SJ (Swedish rail) procured a fast train, called X2000, in the 1980s, it insisted on a locomotive-drawn train. The competing Italian model

[28] An example of functional procurement might be a public transportation agency, or a local government offering to buy a specified maximum decibel level in an apartment building close to a road or railway – instead of describing a noise barrier (e.g. a fence) in the tender documentation. The targeted decibel level can be achieved by suppliers/innovators in many ways (e.g. an earth wall, trees and plants, 'silent' asphalt, lower speed - thanks to surveillance cameras, something not yet imagined by anyone, etc.) – and which particular method or device leads to the mitigation of the problem does/should not matter.

(Endoline) had a motor in each carriage, as opposed to the X2000. This made Pendolino much more flexible, giving it an advantage in all export markets. The end result is that Pendolino is used in a host of countries, while X2000 is only used in Sweden. The Swedish solution was falling behind in terms of international technological competition. This illustrates the effect of a lack of competence in a procuring agency. It is also an example of the devastating effect that too-specific product requirements may have on the outcome. SJ should have specified only functional requirements such as speed, safety, comfort and so on, rather than making the specific requirement that the train should be locomotive-drawn (Edquist, Hammarqvist and Hommen 2000).

Other ways of mitigating the problem of the lack of expertise of the procurement authority is through consultants and market consultations. Spain is applying this for the IEP project NieblA-8 that had a public consultation lead by the Ministry of Public Works-DG Roads to learn technology or innovation market offers to solve the problems of salty fogs coming from the sea that obliges the police to cut traffic circulation during summers in a very important northern coast highway (A-8).

During the specific session on the topic relevant to defining the specifications, important themes arose in the discussions: (i) the need to ensure clarity on the roles of the different organisations concerned with innovation policy, funding, innovation procurement and procurement and (ii) the need to ensure that the different organisations were communicating and coordinating activities and 'pulling in the same direction'.

6.4 Competence-building in procurers and procurement support

I drew attention in the previous section to how function-specification can be demanding in terms of competence and ability, and that the lack of such competence can be an obstacle to functional procurement (see also sections 4 and 5.2). Hence, the procuring authority/unit must see to it that it develops the competence to make functional specifications directly related to the needs and problems that it wishes a product (good, service or system) to deal with. Accordingly, the competence will have to be problem-specific, sector-specific and even product-specific. Needless to say, this cannot be provided by an organization that offers procurement support to all the procuring authorities/units. This calls for the establishment of mutual learning dialogues with different stakeholders that have a more in-depth knowledge of the problems.

However, generic procurement support to the pursuit of functional procurement is also called for. General support may also comprise legal advice, support in the procurement process, preparation, implementation of the bidding procedures and so on.

As has been argued here, however, there is a fundamental difference between regular product procurement and functional procurement. The latter may require more competence since it is a matter of innovative thinking and perhaps buying products that do not already exist.

In order to enhance innovation in public procurement, a considerable part of the procurement support ought to be specifically directed towards functional procurement, since it is a central common denominator to all innovation-related public procurement (as argued in section 4). Therefore, the most important contribution that can be made through procurement support to innovation is to provide support for the implementation of functional procurement. People with specific competence in functional procurement must be available to the procurement-supporting organization, e.g. through employment or consulting. This organization should also collect and describe cases of successful functional procurement and produce a manual for pursuing functional innovation procurement. Another important task for such organisations is to create and collect statistics about innovation related procurement of various kinds, as this will help them monitor their initiatives, and evaluate them as well as assess their impact in the long run. Evaluation is thus crucial if public funds are to provide additionality and be used effectively, which is one of the rationales for the use of IEP as a demand-side innovation policy instrument. The creation of statistics will be addressed in another Thematic Report within this MLE.

6.5 Risks/risk aversion

Risks and risk aversion associated with innovation procurement is an important obstacle, very much recognized by the MLE participants. Conducting regular product procurement is often easier and incurs less risk than carrying out innovation procurement. The larger risk associated with innovation procurement affects procuring organisations as well as employees, and it reduces their propensity to carry out innovation-enhancing procurement.

In a dedicated session on the topic, participants first discussed the various types of risks that exist. On the procurement/demand side, it included leadership/political risks, legal risks, financial risks, management (process) risk. Other risks mentioned were related to the lack of competence on the public side, due to the often-technical character of the innovations. It was argued that governments are better at handling risks associated to management processes risks than technical ones, due to the type of competence of the people working in the public sector. Discussion between risk and perceived risk: for executives, who are in charge of the implementation of the projects, probably the perceived risk is very high, even if the risk of the project at that municipal level is not that high.

Perceived imbalances between upsides and downsides for procurers/ procuring entities also exist. A *perceived imbalance exists between* the potential *downsides* (like being sued and getting fined by supervisory authorities or courts, or like the innovative solution proving to be a failure in the end) and lack of *upside* (because they do not get to reap the benefits of their work if they succeed) for operators in procuring entities. This has been highlighted *inter alia* by the report from Menon Business Economics delivered to the Norwegian Min. of TIF of 22 Feb. 2016[29].

A distinction was also made between the risk of the supplier and risks encountered by the demand side. The first kind of risk is whether anyone will buy the new product if the supplier develops it. How can the procurer convince the supplier that he is a credible customer? This led to a discussion about what procurers can do to alleviate the risks of the supplier. Some examples were offered of those who aim to demonstrate a viable market and create a group of early adopters such as the creation of 'Buyers groups' by the Energy Agency of Sweden; joint statements of demand' and 'procurement compacts' which bring customers together around a common need that is communicated to the market; and introducing other interested parties in market engagement meetings. It was noted that innovation takes time, so providing a guarantee or promise of purchase (subject to delivery) reduces investment risk – this is the principle of forward commitment procurement. Tax incentives are provided in Portugal for suppliers who can demonstrate that they invested in innovation to address the need of a public body.

Regarding the risks encountered by the demand side, there was reflections on a range of issues such as political risk, changes of political administrations leading to changes in policy priorities and professional risk (risk for complaints from non-winners, leading to a low risk culture). The group concluded that risks can be managed. One tentative idea was to explore the possibility to do so are insurances used to underwrite risks. The participants had no experience of this but discussed its possible merits and forms, highlighted the potential unintended consequences such as decreased responsibility and thought that in certain limited cases it could be useful. It was also pointed out that the risk of *not* innovating was rarely considered at all in risk assessments.

At the Workshop on strategic frameworks for the four kinds of procurement addressed in this MLE (The Hague, March 23, 2017), it was argued by Member States representatives that there exists an overall risk aversion. Life Cycle Cost (LCC) and Life Cycle Analysis considerations or total cost of ownership (TCO) calculations are up-taking the cost-issue whereby widening procurer's focus towards the 'most economically advantageous tender'

[29]See here: https://www.regjeringen.no/contentassets/7a8fb1ce151746db948347859fd1d1e6/rapport---utredning-om-insentiverordninger-for-risikoavlastning-for-innovative-offentlige-anskaffelser-22-feb-2016.pdf A summary of the report in English is available.

rather than the 'best price-quality ratio'. This may allow for somewhat more risk taking. Trust-building between suppliers and procurers was mentioned as an important aspect towards overcoming risk aversion. Thereby face-to-face interaction seems to be of importance. This is an important observation since many Member States are increasingly installing e-platforms to perform supplier-procurer interaction. Maybe a balanced combination of both (e-exchange and face-to-face exchange) is the appropriate solution.

At the seminar, there were arguments that (1) financial incentives, (2) providing awareness/training/education/support, and (3) establishing procurement as a strategic issue with declared goals and leadership focus within the public sector are appropriate means to overcome or at least to decrease risk aversion. A certain level of tolerance for risk and failure also seems to be essential, as well as sufficient time and work hours for preparing IEP-procedures thoroughly.

In section 4, it was stressed that functional regular procurement opens up for innovation, but does not require innovations. Therefore the risk of failure of the procurement (that the result cannot be delivered) is actually smaller with regular functional procurement than with innovation procurement (which is also functional). Emphasizing regular functional procurement more than innovation procurement therefore decreases the importance of risk as an obstacle.[30] However, a thorough preparation of functional specifications that are non-discriminatory and can in addition be measured, takes time, effort and thorough market knowledge. To acquire this last-mentioned competence tends to take both time and repeated structured dialogue with the market of potential furnishers.

In addition to the problem of risks *as such*, the administrators responsible for procurement are subject to *aversion* against risks, which is a very important obstacle to functional/innovation procurement. In this respect, there may be differences between politicians and administrators. Politician can commit to boost IEP but in the end, the implementation falls under the responsibility of procurement administrators, who may be more concerned with strictly following rules than enhancing innovation.

Administrators often prefer to copy-and-paste from the previous call for tenders, and describe the product, i.e. pursue "product procurement" (Edquist 2014c). They often believe that it is much more complicated to describe functions. This may be true in some cases, but certainly not in the decibel example referred to earlier. This risk aversion has its basis in the procuring authority's/unit's competence and, in my view, the complicated and at times ambiguous legislation with which they must deal. As a procurer or administrator, one is more prone not to break the law or risk legal proceedings, rather than pushing innovation forward. Politicians have thus a big responsibility in changing this institutional setting by encouraging such a transition and provide political backing.

If innovation procurement is to be carried out on a large scale, one may have to accept risks that are larger than in regular product procurement buying existing products "off-the-shelf". However, functional regular procurement may also enhance innovation, without increasing risk. In both cases creativity and innovativeness would increase among suppliers, and for the public sector. It would also lead to increased competition (also between different solutions to the same problem) and to a higher quality of the public services, i.e. to innovations in the public sector. Hence, functional public procurement has the largest potential to enhance innovations of all kinds of procurement.

If the management and staff of a procuring authority/unit are to be induced to take larger risks, they should be" protected" by the politicians. The enormous volume of public procurement supports this argument. A certain number of risky projects may be taken on by an organization as part of a larger" portfolio" in order to spread the risk. On the other hand, the media often criticizes failures and tends to single out individual politicians and

[30] This is one reason why I, somewhat paradoxically, emphasized (in section 4) that functional procurement is more important than innovation procurement, if the objective is to achieve innovations through public procurement.

individual projects, rather than accepting isolated instances of failure as natural. This may be reflected in opinion polls and elections. Thus, considerable political skill is required to direct attention to procurement portfolios as a whole (Edquist et al, 2015). At the same time, this also calls for an evaluation culture that provides societal actors with the required evidence for the decisions made by public organisations.

This certainly looks like a "catch 22" situation. Regardless, it is necessary for politicians to encourage absorption of these risks so that risk-taking in the procuring authority/unit does not become too much of a disincentive for increased functional and innovation procurement. A mechanism to absorb such risks would be to create an insurance system for functional and innovation procurement (direct or catalytic). One way of going about this, will be to adopt a certain level of tolerance for failure, like certain performance goals not being reached 100% or an innovative solution not actually working well enough in order to be taken into regular use. Another may be the introduction of funding mechanisms.

6.6 Lack of interactive learning and procurement rules

Public procurement (including innovation and functional procurement) is governed by European procurement legislation – partly addressed in section 5.1. In my view, the mandatory European directives are quite complicated and many public procurement administrators tend to have a similar view. The EU rules can be complemented by Member State specific regulations. In the past, the concept of innovation procurement could not be found in the earlier EU procurement legislation. However, as argued (section 4) "functional demands" was, and still is, a part of the legislation and can always be used in tender specifications (see earlier).

EU procurement regulations have functioned as a significant obstacle to public procurement intended to lead to innovations. For instance, the EU regulations on state aid constitute a part of the regulations intended to ensure that competition in the common (EU) market is not distorted. The regulatory framework for procurement has therefore, to a large extent, been dictated by the wish to promote competition rather than innovation. There are also obstacles resulting from inadequate knowledge of the regulations and a "fear" of them (see section 6.5).

These regulations have been discussed and criticized in political and academic debates, for example (Martin 1996; Edquist, Hommen and Tsipouri 2000; Edler and Georghiou, 2007; and Rolfstam, 2009). Such discussions have, in fact, led to changes in the regulations in the 2000s. For instance, now the EU procurement directives have been changed to enable certain possibilities of dialogue (or interactive learning) between the procuring authority/unit and suppliers (Edler and Georghiou 2007: 960). Such dialogue is a necessity if the parties to a functional or innovation procurement process are to understand each other and be able to practice "interactive learning", which is an important source of a large amount of innovations.

With the new EU Directives from 2014 the view on innovation has changed. I recital 95, it is mentioned that "…public procurement is crucial to driving innovation", and in recital 123 it is said that "…innovation procurement will also have to play its part." In recital 47 it is also emphasized that "Public authorities should make the best strategic use of public procurement to spur innovation." (Directive 2014/24/EU)

In the 2014 Directives the new procurement procedure of "innovation partnership" is also introduced. The following is a quote from recital 49: "Where a need for the development of an innovative product or service or innovative works and the subsequent purchase of the resulting supplies, services or works cannot be met by solutions already available on the market, contracting authorities should have access to a specific procurement procedure in respect of contracts falling within the scope of this Directive. This specific procedure should allow contracting authorities to establish a long-term innovation partnership for the development and subsequent purchase of a new, innovative product, service or works….. The innovation partnership should be based on the procedural rules that apply to the competitive procedure with negotiation and contracts should be awarded on the sole basis

of the best price-quality ratio, which is most suitable for comparing tenders for innovative solutions." (Directive 2014/24/EU)

Three quotes from Article 31 are:

- "In the procurement documents, the contracting authority shall identify the need for an innovative product, service or works that cannot be met by purchasing products, services or works already available on the market."

- "The innovation partnership shall be structured in successive phases following the sequence of steps in the research and innovation process, which may include the manufacturing of the products, the provision of the services or the completion of the works."

- "In selecting candidates, contracting authorities shall in particular apply criteria concerning the candidates' capacity in the field of research and development and of developing and implementing innovative solutions."

Hence R&D as well as innovation and manufacturing are stressed to a larger extent than before, and partly in a combined way, in this procurement procedure. In the context of innovation partnerships, there is, however, no mention of functional specifications, although such specifications seem to be necessary when the product is not known, judging from arguments presented in section 4. The general resistance to use functional specifications by many procurement administrators, might make them abstain also here. It would therefore had been pedagogical to mention that functinal specifications can be a good idea also in this context.

There are reasons to continue these discussions and introduce more changes in the regulations, in particular changes that enhance innovations in procurement processes, particularly functional procurement. There is also room for considerable simplifications of the directives.

6.7 Further work

There are many other obstacles to functional and innovation procurement, as well as Pre-Commercial Procurement. Three of them will be addressed in the other threeTopics (B, C and D) focused in this MLE. They are:

- Capacity Building

- Financial mechanisms

- Monitoring, measuring, evaluation and impact assessment

To some extent I have above addressed capacity building, but not the other two. All three of them will be focused in three other Thematic Reports within this MLE.

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Appendix I: Organisational set-up in participating countries

More or less all Member States use agencies for giving advice, running programs and providing financing relevant for innovation related procurement. The representatives of the following gave each a short overview of the situation in their country:

Germany – especially North Rhine-Westphalia (NRW): The coordination between ministries is crucial which means politics plus policy makers are backing. The budget is supplied by the Ministry for Innovation Science and Research in NRW; the innovation agency ZENIT provides only support. On federal level a role was missing and therefore KOINNO was established with an EU Contact Point for PCP/PPI placed at ZENIT. Of utmost importance during the process are sets of rules on all levels – not only formal institutions but also informal/social.

Norway: Ministry of Industry and Trade is (mainly) responsible. Several agencies with different responsibilities are providing guidelines, good practice, examples etc. A supplier development program exists (evaluation of the period 2010-2015) and a procurer platform has been recently established. Financing is provided via 'Innovation Norway' (complemented by financing from the Research Council).

Sweden: The Swedish government took a decision to adopt the National Procurement Strategy on June, 30, 2016. Functional procurement is an important element in that strategy. The implementation of The Swedish National Procurement Strategy started after the summer 2016. The Swedish government has given this task to the Agency for Public Procurement (Upphandlingsmyndigheten, UHM). If the implementation process continues well, Sweden will be the first country to systematically use functional regular public procurement as an innovation policy instrument. As a result of these recent changes, functional public procurement may develop into the most important instrument in Swedish innovation policy.

Latvia: Coordination between the Ministry of Finance (holds responsibility for the procurement policy in Latvia), the Ministry of Economics (main organization responsible for the innovation policy), and the Ministry of Environment and Regional Development (green procurement) is required. The Procurement Monitoring Bureau should play a central role in giving advice etc. Financing support mechanisms for PPI could be implemented via the Investment and Development Agency and the State Education & Development Agency.

Lithuania: Coordination between the Ministry of Economy (responsible for the Procurement policy and Innovation Policy in Lithuania) and Agency for Science, Innovation and Technology (responsible for the implementation of innovation policy in Lithuania) is required. The Ministry of Environment is responsible for the green procurement. Agency for Science, Innovation and Technology (MITA) is the coordinating organization which is entrusted with the administration of pre-commercial procurement by the Government of the Republic of Lithuania.

Estonia: Coordination between the Ministry of Economics and the Ministry Finance. Financing is provided via the agency Enterprise Estonia. A platform for market dialogues between suppliers/procurers is on its way to be established. The platform 'The State as a Smart Customer' runs a monitoring system to control the impact of activities from 2017.

Netherlands: the Ministry of Economics is responsible for the procurement law (Department of Energy, Telecom & Competition) and innovation procurement (Department of Business and Innovation). PIANOo is the Dutch Public Procurement Expertise Centre, set up in 2006. PIANOo brings public procurement experts together, pools knowledge and experience and provides advice on amongst others innovation procurement and procurement law. PIANOo is part of the Dutch Enterprise Agency and primarily financed by the Ministry of Economic Affairs.

Austria: Based on the PPPI (Public Procurement Promoting Innovation) Action Plan the Austrian PPPI initiative is led and financed by the Federal Ministry for Transport, Innovation and Technology (BMVIT) and the Federal Ministry of Science, Research and Economy (BMWFW). It is supported by a network ("service network") of competence centers and contact points, complementing the central PPPI service center that has been established within BBG in September 2013. Coordination between Ministry of Economy and Ministry of Innovation. Several agencies cooperate on the basis of an Innovation Procurement Action Plan (service network). Financing is provided via the Austrian Research Promotion Agency.

Spain: Structure of Concerted Competence Centres for Public Procurement led by SGCI (Secretariat General of Science and Innovation of the Ministry for Economy, Industry and Competitiveness). Depending on SGCI, the Deputy Directorate General for Innovation Promotion fosters Public Procurement of Innovation (PPI) and leads the legal and financial structuring as well as the ESIF management for PPI and the evaluation of economic impact of PPI. Hanging on SGCI, the innovation agency CDTI is the manager of one innovation procurement financing mechanism in Spain. Based on two cooperation agreements with the SGCI, MSSSI (Ministry of Health, Social Services and Equality) and INTA (National Institute for Aerospace Technologies) are supporting SGCI in the fields of health and dual technologies respectively. **At the end of 2010** an Action Plan and Working Groups were established for the implementation of Innovation Procurement instruments by the Ministry of Economy, Industry and Competitiveness.

France: The Ministry of Economy is in charge of the steering of the PPI policy. A target is set: 2% of public procurement (about 1 Billion) must be for innovative companies. Three departments of the Ministry of Economy have mutually an important role:

- DGE (Directorate General for Companies) is in charge of the strategic definition of the policy, promotion to innovative companies and the animation of networks locally (in each region)

- DAE (Directorate of state procurement): is in charge of the implementation of the PPI strategy of each ministry and ensures the support and awareness of procurers (several actions are implemented)

- DAJ (Directorate for Legal Affairs): role of buyers' advice to facilitate the understanding of the regulation to contract with innovative companies.

Turkey: Turkey's "Programme for Technology Development and Domestic Production through Public Procurement" is one of the 25 primary transformation programs within the frame of 10th National Development Plan (2014-2018). The Grand National Assembly of Turkey approved the programme in 2013. The aim of the programme is to use public procurement to promote innovation, domestic production, technology transfer and innovative entrepreneurship. The programme is coordinated by the Ministry of Science, Industry and Technology. After the adoption of the Tenth Development Plan and Priority Transformation Programs by the Grand National Assembly of Turkey, a (stand-alone) action plan for "Program for Technology Development Through Public Procurement" has been prepared under the coordination of Ministry of Science, Industry and Technology.

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