



Public Procurement for Innovation as mission-oriented innovation policy

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ABSTRACT

This article focuses on Public Procurement for Innovation as a relevant demand-side instrument to be exploited in the mitigation of grand challenges. It intends to provide some clarification on what should (and what should not) be regarded as innovation procurement. It defines what is meant by Public Procurement for Innovation and categorizes it according to three dimensions: (i) the user of the purchased good; (ii) the character of the procurement process; and (iii) the cooperative or non-cooperative nature of the process. In addition, it illustrates the main stages in innovation procurement processes and exemplifies them with six cases to provide evidence that Public Procurement for Innovation can contribute to satisfying unsatisfied human needs and solving societal problems.

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1. Introduction

Public organizations may place an order for something (normally a product or a system) that does not exist; hence, this “something” has to be developed by the supplier before it can be delivered. In other words, innovations are needed before delivery can take place. Until about 10 years ago this phenomenon was called “public technology procurement” (Edquist et al., 2000a). Since then, this vocabulary of the 1990s and earlier has changed. The concept of “technology” has been replaced by the concept of “innovation”, reflecting a widening of the content of the notion. It is a matter of using public demand (or similar) to trigger innovation. We will use the term “Public Procurement for Innovation” (PPI) to denote this phenomenon.

However, the (non-existing) product ordered in the process of PPI is not the beginning of the process or its objective. Instead, the rationale for PPI is:

- To satisfy human needs, and/or
- To solve societal problems.

This is why PPI is so relevant in the context of grand challenges, the idea being to mitigate these challenges through the kind of innovation policy instrument that we call PPI. However, the nature of grand challenges such as global warming, tightening supplies of

energy, water and food, ageing societies, public health, pandemics or security (Lund declaration, 2009) does not allow defining policies to target them as a whole, at the same time and with only one policy instrument. As it is simply not possible to work at such levels of aggregation, policies need to address narrower targets and partial problems linked to those grand challenges. This is in fact reflected in the use of PPI for meeting human needs and mitigating societal problems, where more limited goals are set for those programs (e.g. energy saving of a certain kind, improving mobility with regard to passenger transport, increasing security in a specific field). We would argue that most mission-oriented policy mitigation of grand challenges has – and must have – a narrower focus as compared to the grand challenges as such, simply because they are so “grand”. It should be added that PPI certainly includes innovations intended to meet needs (‘missions’) of public agencies themselves, if they are related to general human needs or societal problems (see direct PPI in Section 3 and four of the cases in Section 5).

Needless to say, grand challenges can also be mitigated through other means and instruments, for example R&D funding, tax credits, environmentally motivated regulations and standards (e.g. mileage standards for automobiles), creation of markets for innovative ideas, support for education and training or enhancing capacities for knowledge exchange (OECD, 2011). Nonetheless, instruments other than PPI will not be addressed here, except for brief references in cases when they are closely combined with PPI in the “policy-mix” (Flanagan et al., 2011).

A new interest, at the European level, has recently emerged with regard to demand-side approaches to innovation policy (Edquist and Hommen, 1999) and, more specifically, the use of public

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demand as an engine for the development and diffusion of innovations. In early 2004 three governments issued a position paper to the European Council calling for the use of public procurement across Europe to spur innovation (Edler and Georghiou, 2007; French/German/UK Governments, 2004). This development continued and was manifested in various reports, including the Aho Group Report (Aho et al., 2006). The Aho Group identified several application areas – or grand challenges – where demand-side policies could be used to a larger extent: e-Health, Pharmaceuticals, Energy, Environment, Transport and Logistics, Security and Digital Content (Edler and Georghiou, 2007, p. 951). There seems to be much less talk about innovation procurement in the US than in Europe (Vonortas et al., 2011). We suspect, however, that other fields of US government policy involving “mission agencies”, such as defense or energy, incorporate elements of PPI. Discussion of the differences between European and US practices regarding PPI seems to conflate the use of procurement to meet societal challenges with the use of procurement to meet mission-agency needs. PPI in the US has often been used for the latter and less frequently for the former (Thai, 2001). It has also been used for mission-agency needs in Europe and elsewhere.

The aim of this article is to contribute to clarifying the characteristics of (different kinds of) PPI, how PPI has been used, as well as, briefly, its relationship to other public innovation policy instruments. We have therefore decided to base this article firmly on empirical experiences by using a number of examples of PPI. Section 5 contains six case descriptions of PPI. Before that, the context for PPI is presented in Section 2. A few definitions that are necessary to structure and characterize the cases are introduced in Section 3. The methodology and the dimensions of the cases are found in Section 4, as is a detailed summary of the case descriptions (Table 2). The conclusions and policy implications are addressed in Section 6.

2. Interaction in innovation systems

Innovation processes occur over time and are influenced by many factors. Because of this complexity, firms almost never innovate in isolation, but interact with other organizations to gain, develop, and exchange various kinds of knowledge, information and other resources.

These interactions among organizations (players) operating in different institutional contexts are important for innovation processes (Edquist, 2011). What we call ‘activities’ in the Systems of Innovation (SI) are the determinants of the development and diffusion of innovations. Examples of activities are Research and Development (R&D), the financing of the commercialization of such knowledge, or demand-side activities such as the formation of new product markets or the articulation of new product quality requirements.

Hence, the development and diffusion of innovations are highly influenced by demand that may emanate from either private or public organizations (players).¹ This article will disregard the influence from private organizations (e.g. demand from customer firms or individual consumers) and only address the demand from public organizations.

PPI is an important demand-side innovation policy instrument (Dalpé, 1994; Edler and Georghiou, 2007; Geroski, 1990; Rothwell and Zegveld, 1981), and from now on this article will concentrate on PPI. Hence, it is generic with regard to research areas or grand challenges; it deals with one innovation policy instrument that can potentially be used to mitigate many different challenges. As we

¹ Public means that the activity is performed by an agency or organization (player) that is a part of the local or municipal authorities, the regional authorities, the national state, or supranational bodies.

have seen, and will see, PPI is one example of interaction between organizations (procurers and suppliers), which is strongly stressed as a source of innovation in the SI approach.

3. Defining and classifying innovation procurement

Innovations are new creations of economic or societal significance mainly carried out by firms (but not in isolation). They may be new products or new processes. New products may be material goods or intangible services; it is a matter of what is produced. New processes may be technological or organizational; it is a matter of how the products are produced.

Non-firm public organizations do not normally take part directly in the innovation processes, although they certainly are important organizations participating in the research and invention activities that influence innovation. They affect (change, reinforce, improve) the context in which the innovating firms operate. As indicated in Section 2, this context includes all the determinants of innovation processes. *Innovation policy* may thus be understood as actions by public organizations that influence innovation processes, i.e. the development and diffusion of innovations (Edquist, 2011).²

Public procurement means that a public organization buys a product (a good or a service or a combination of the two, which might be called a system). *Public Procurement for Innovation* (PPI) occurs when a public organization places an order for the fulfillment of certain functions within a reasonable period of time (through a new product).³ Hence, the objective (purpose, rationale) of PPI is not primarily to enhance the development of new products, but to target functions that satisfy human needs or solve societal problems. We must point out here that the diffusion of the product from the procuring organizations is not always among the major objectives of this type of program. However, there are cases in which diffusion of the new product is aimed at from the very start of the procurement process. This difference reflects the distinction between PPI carried out mainly for the missions or needs of the procuring agency and PPI to support economy-wide innovation. Be that as it may, innovation is needed in all PPI before delivery can take place. In contrast to PPI, *regular procurement* occurs when public agencies buy ready-made products such as pens and paper “off-the-shelf”, where no innovation is involved. Only the price and quality of the (existing) product are taken into consideration when the supplier is selected.

We will now present a taxonomy of different phenomena that are, or should be, labeled PPI or innovation procurement (Edler, 2009; Edquist et al., 2000a; Hommen and Rolfstam, 2009; Uyarra and Flanagan, 2010). The taxonomy will be used to classify the cases presented later. The first dimension refers to whom the *user* of the resulting product (good, service, system, etc.) is, which we can then use to identify two different categories of PPI: direct and catalytic.

- *Direct PPI* is when the procuring organization is also the end-user of the product resulting from the procurement. The buying agency simply uses its own demand or need to influence or induce

² This implies that innovation policy also includes actions by public organizations that unintentionally affect innovation.

³ The public organization may also financially contribute directly to the R&D leading to the development of the product. However, such contributions are not intrinsic parts of the PPI as such. Public R&D funding is a different – complementary – policy instrument in the policy-mix, one which is not in focus here. The purchase of a non-existing product is the central element of PPI. However, the development costs of the new product are, of course, indirectly supported by the procurer by (initially) paying a high price for the product. This is part of the very idea of PPI, but since the procurers’ commitment is only to buy a number of units of the product at a certain price, this support of the development cost is brought about through the product price mechanism and cannot be regarded as direct public R&D funding.

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