

Pre-commercial Public Procurement
A missing link in the European Innovation Cycle
Public Needs as a driver for innovation

Lieve Bos and Stephan Corvers*

Introduction

This article¹ introduces the concept of ‘pre-commercial procurement of innovation’. *Pre-commercial* public procurement precedes *commercial* public procurement in the product development and procurers buying process. In cases where no commercial solutions exist yet on the market, pre-commercial procurement enables public authorities to get new technologically innovative solutions developed according to their specific needs. Steering industrial product development more upstream in the industrial product development process than is the case today enables public authorities to improve the quality, effectiveness and efficiency of their public services faster.

Pre-commercial procurement addresses the missing link in innovation in Europe where public procurers, as technologically demanding first buyers, share with suppliers the risks and benefits of moving research developments from their early stages (solution design, prototyping) to tested pre-commercial products, ready for commercialisation.

This article shows how such a first-buyer function can be built up in a European single market that aims at being competitive, fair and transparent. It explains how pre-commercial procurement can be organized within the WTO rules, applying the new public procurement directives and the state aid rules.

Legally pre-commercial procurement is a public procurement of R&D services that falls under an exception of the WTO rules and the public procurement directives. As a result, in contrast to commercial procurement, (1) risk-benefit sharing between procurers and suppliers is allowed and (2) offers from outside the European Economic Area do not have to be accepted. The fundamental Treaty principles of non-discrimination, transparency and objectivity are however applicable and thus the procurers have to accept European-wide offers.

If applied as a strategic policy tool to boost innovation from the demand side, pre-commercial procurement can open up opportunities for European companies to take a leadership position in new markets in the context of global competition. At the same time it contributes to consolidate market needs, facilitate interoperability and supports the emergence of standards.

By developing a strong European home market for innovative products and services, pre-commercial procurement reduces the time to market. Especially in quickly evolving markets, such as Information and Communication Technologies (ICT), this is key for Europe to create growth and jobs. Moreover ICTs are constitutional technologies which do not only ‘enable’ but ‘shape’ the pace and impact of innovation projects on organisations. Knowing that ICTs have an impact of around 50% on productivity growth², it’s not surprising that the majority of innovative public procurement projects today rely on ICT³. As a

* Lieve Bos is Research Policy Officer in the Lisbon Strategy Directorate of DG INFSO and rapporteur of the report upon which this article is based. Stephan Corvers is founder of Corvers Procurement Services B.V. in strategic alliance with Bartels Sueters Fischer procurement lawyers in the Netherlands and independent expert of procurement and innovation to DG INFSO. The views expressed in this article are those of the authors and do not necessarily represent the official view of the European Commission on the subject.

¹ This article is based upon extracts of a report of an ad-hoc group of independent national experts. The report was published by DG INFSO (Directorate General for Information Society and Media, European Commission) in March 2006 (http://europa.eu.int/information_society/research/key_docs/documents/procurement.pdf).

² B. van Ark and R. Inklaar: Catching up or Getting Stuck? Europe’s Troubles to Exploit ICT’s Productivity Potential, GGDC, University of Groningen, September 2005.

³ The Fraunhofer Report, Report of the Independent Expert Group lead by Fraunhofer Institute – conducted for DG ENTR,

matter of illustration, this article refers from time to time to examples in the ICT sector. It has to be noted however that pre-commercial public procurement is not an instrument specific for the ICT sector. It can be applied in every R&D intensive sector.

In the article one possible approach to implement pre-commercial procurement is discussed. The approach is similar to US schemes but adapted to the European context. Practically pre-commercial procurement can take the form of a single public procurement contract managed in three phases; the first phase being a solution exploration phase, followed by a prototyping phase and finally a test series. In the first phase a number of offers (e.g. 6 to 7) from competing suppliers could be selected. The number of suppliers developing in parallel is progressively reduced after each phase subsequent to evaluations. In the final phase at least two contractors should remain to ensure a future competitive market.

1. Rationale for pre-commercial procurement

Increasing **European competitiveness** in the global marketplace is a top priority of the Lisbon Agenda for the EU and Member States. The Lisbon agenda highlights the need for actions on a wide scale. For example, there is a need to develop the market for risk capital, to increase the availability of seed money and funding of expansion. There is also still a lot to be done to strengthen the Single Market, to implement deregulations and to introduce competitive practices such as the new directives for public procurement.

Instrumental in achieving the objective of the Lisbon Agenda is to enhance **European Innovation**, the capacity to valorise new R&D results into marketable products and services. Recognising that efforts need to go beyond increasing R&D investments up to levels comparable with US & Japan,⁴ the renewed Commission action plan on the Lisbon Partnership for Growth and Jobs⁵ has called for **an integrated approach to research and innovation**. As a concrete measure to improve the conditions for commercialisation and exploitation of the research results, the action plan underlines explicitly the huge potential of using public procurement to encourage innovation by providing a 'lead market' for new technologies.⁶

Public authorities and utility companies still face the need – and even the obligation with regards to tax payers - to provide citizens with services of public interest of the best possible quality. As public goods and services often face a situation of market failure⁷ in the sense that the natural market incentive for suppliers to invest in research and innovation for private sector customers is higher than for public sector customers, public authorities are entitled to consciously drive innovation from the demand side in those markets. It is from this mindset that this article addresses public procurement.

To address this problem we need to implement pre-commercial procurement in Europe. In other parts of the world such as the US and some Asian countries, pre-commercial procurement schemes have proven their ability to provide the missing link between private sector R&D investment and the public sector as 'first buyer' of new technologies. This invaluable experience in refining the first-buyer strategy reveals that the pay-off in terms of creating truly sizeable lead markets for new technologies is only going to be significant when applied in Europe if our pre-commercial procurement strategy respects two

Innovation and Public Procurement: Review of issues at stake', March 2006

⁴ *The January 2006 Innovation Scoreboard* ([IP/06/21](#)) confirms that the gap with US, Japan and newly emerging world class R&I centres China and India will not close if EU-25 simply continue along their current R&I trends.
http://trendchart.cordis.lu/tc_policy_information_fiche.cfm?id=3197

⁵ Renewed Commission action plan on the Lisbon partnership for growth and jobs, [MEMO/05/366](#), 12 October 2005,
<http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/05/366&format=HTML&aged=1&language=EN&guiLanguage=en>

⁶ Website of the *Lisbon partnership for growth and jobs: 'Time to Move up a gear'*:
http://europa.eu.int/growthandjobs/areas/fiche06_en.htm

⁷ See page 8 on definition of market failures (e.g. for public goods/services): "State Aid Action Plan: Less and Better Targeted State Aid: A Roadmap for State Aid Reform 2005-2009"

fundamental principles⁸: (1) willingness of public procurers to share risks and benefits of high-tech R&D procurements with future suppliers, (2) bundling of demand to reduce market fragmentation and narrow the R&D public procurement investment gap between the EU and the US. We also need incentives to overcome risk aversion of public procurers. These issues will be analysed in further detail in this article.

2. Setting the Scene

2.1. The Market Forces – Trade giants on the watch

Public procurement makes up an important share (15-20%) of GDP in developed economies.⁹ In 2002 the OECD¹⁰ estimated the world total procurement market to be roughly equivalent to 82.3% of the world merchandise and commercial services exports. Today this amounts to \$5500Bn. The size of the world wide contestable¹¹ public procurement market roughly equals the size of the global ICT market (estimated around €2500Bn today).

The WTO Government Procurement Agreement (GPA)¹² forms the basis for regulating the procurement policies and practice of WTO GPA member countries. It is a "plurilateral" agreement, binding its signatories to comply with principles of non-discrimination and to implement procedural rules to guarantee it in those public procurements covered by individual signatories. Suppliers of each GPA member have the right to compete for other GPA members' government contracts, according to each Party's commitments contained in country specific Appendices of the GPA Annexes. All traditional developed economies (US, Canada, Japan, Korea, Hong Kong China, EU-25) except Australia and New Zealand are Parties to the WTO GPA. Though developing countries are allowed to have a "*special and differential treatment – such as promoting the establishment and development of domestic industries - in order to meet their specific development objectives*", none of them - including Mainland China and India have yet joined WTO GPA.

2.1. WTO rules and US practices

Due to their remoteness from the commercial trade arena, pre-commercial R&D services are by definition an exception¹³ case in the WTO GPA. The US has translated the WTO R&D exception in combination with the Buy-American restriction into explicit access restrictions to US controlled suppliers in US R&D public procurements.

Apart from the reliance on special WTO exceptions, the US R&D procurement success is mainly characterized by effective application of technology risk management techniques (defence pioneering) and the early exploitation of economies of scale on the US home market. The US contestable public procurement market is of the same order of magnitude as the EU one.¹⁴ Yet, the effectiveness of these two home procurement markets in pulling high-tech R&D into marketable innovations is very different.

2.2. State of play in the Member States

⁸ 'Exploiting the UK science and technology base: how to fill the gaping hole in UK government policy', Dec 2004, David Connell, CEO TTP Venture Managers.

⁹ For the OECD countries as a whole (2002 data), the ratio of total procurement (consumption and investment expenditure) for all levels of government is estimated at 19.96% or \$4 733 billion and for the non-OECD countries the ratio is estimated at 14.48% or \$816 billion. In Europe Public Procurement represents 16% of GDP (€1500Bn).

¹⁰ 'The Size of Government Procurement Markets', OECD Journal on Budgeting, Vol. 1 No.4, OECD (2002)

¹¹ The contestable part of a public procurement market is the part opened by government to potential international competition.

¹² WTO GPA (Government Procurement Agreement) http://www.wto.org/English/tratop_e/gproc_e/gp_gpa_e.htm

¹³ Pre-commercial R&D supplies and prototypes are excluded from the competition obligation but not from the non-discrimination obligation. Pre-commercial R&D services are completely excluded from the WTO GPA.

¹⁴ 'The interaction between levels of rulemaking between public procurement, trade and investment', London School of Economics (Dec 2004) based on 2004 data from OECD

In November 2005, the Commission Joint Research Centre department IPTS¹⁵ was asked to carry out interviews with representatives from Member States to collect an overview of the current situation in the EU-25 with regards to public procurement practices in support of ICT Research and Innovation, in comparison with case studies from other parts of the world.

Interviewed national experts unanimously consider the size of public procurement in support of research and innovation as marginal in total public procurement. The main purpose of ICT procurement in the public sector is currently cost reduction in administration and maintenance of existing products and services.

Experts agree that, although there are more innovation-receptive niches (defence, health, transport and taxation), overall public procurement is not really realising its innovation potential in Europe.

While public procurement is undergoing an important modernisation across Europe, the Commission end 2005 review of the National Reform Programmes¹⁶ confirms that “*very few Member States present plans to use public procurement to promote innovation*”. In terms of setting concrete targets only Portugal (plan to allocate 20% of large public contracts to R&D and innovation projects) is mentioned.

Thus, public procurement remains very fragmented, not only at national level within and among different institutions and sectors (administration, health, education, defence, etc) but also at regional and local level, where a significant share of procurement is carried out. Aggregation at EU level, although perceived as an opportunity for innovation, remains limited to EU initiatives in eInfrastructures (such as Galileo, INSPIRE, eEarth or GEANT).

Although it is widely recognised that suppliers are more likely to propose innovative solutions if they can keep any related Intellectual Property Rights (IPRs), experts indicate that generally, in Member States, governments keep the IPR in order to facilitate adoption by other departments and save money, although no distinction is made between IPR and rights of usage.

Another important factor is the risk sharing between supplier and purchaser. Although there are many supporting documents and guidelines for risk management, for example in the UK in the context of Public Private Partnerships, they mainly address financial and management risks, not risk-sharing for technological uncertainty. In these cases, a risk is usually attributed to the party which exercises the most control over the project.

Experts often quote awareness of end-user expectations and dialogue with the suppliers as fundamental to improve the quality and innovation of the purchases, both before and during the procurement process. Specific provisions for dealing with unsolicited proposals (e.g. the UK "Ideas Portal"¹⁷) as well as communication platforms between government and ICT industry (e.g. UK "Concept Viability"¹⁷ initiative) can help by identifying potential areas for exploitation of innovation which were not considered by - or known to - the public sector.

2.3. The Institutional Forces – A legal framework on the move

2.3.1. The new Public Procurement Directives – Innovative Procurement

In 2004 the Commission issued a renewed Public Procurement legislative package, clarifying, modernizing and simplifying the previous package into two Directives, 2004/18/EC and 2004/17/EC. In September 2005 the Wilkinson Report¹⁸ - an independent expert report conducted on the request of DG

¹⁵ IPTS (Institute for Prospective Technological Studies), based in Seville, Spain is one of 7 research institutes that make up the Joint Research Centre of the European Commission.

¹⁶ “*Time to move up a gear*”; Communication from the Commission, Brussels, COM(2006) 30

¹⁷ The UK "Ideas Portal" is ‘*a mechanism for firms, inventors and researchers to submit unsolicited, innovative proposals to the public sector.*’ The UK "Concept Viability Initiative" is a service provided by the IT industry to help Public Sector clients take early market soundings to test the practicability of their ideas.

¹⁸ The Wilkinson Report, Report of the Independent Expert Group lead by DTI - conducted for DG RTD, 'Public Procurement for research and innovation: Developing procurement practises favourable to research and innovation', September 2005

RTD Commission Services - identified options for innovative approaches in practice and procedures of procurement based on the new opportunities offered by the 2004 Public Procurement Directives.

Innovative Procurement refers to innovative approaches in "practice" and "procedures" of procurement which results in innovative contractual procurement arrangements. Examples of innovative approaches in "practice" are Full Life Cost Assessment, Value Engineering, Joint Procurement, Design, Construct and Operate. Innovative approaches in "procedures" introduced by the new Public Procurement Directives are Competitive Dialogue¹⁹ and Functional Specifications²⁰.

Acceptance of variant offers, design contests, transfer of IPRs from procurer to supplier, cost sharing between supplier and procurer, life cost assessment, value engineering, risk/cost assessment in tender/offers, subcontracting to SMEs etc were all theoretically possible before the new Directives, but apart from the design contests) not explicitly explained in the old Directives. In practice unfortunately most of the above techniques are not used to a significant extent in Europe.

The change related to the usage of Functional or Performance Based Specifications²¹ is undoubtedly the most useful improvement in the Directives in terms of fostering innovation. Unlike in the old Directives, where the use of functional and performance-based requirements needed to be explained and justified, the new directives have put them on the same level as references to standards. Improvements are made also in terms of the rules of evidence by which companies can prove their compliance. The freedom to provide equivalent evidence will make it easier for companies to prove that they are compliant with the requirement, without using the indicated standard means of evidence.

Figure 1 shows the typical Research and Innovation life cycle to transform a new idea into a commercial product or service. The R&D risk level associated with each stage of the life cycle is indicated on the graph. The research and development work carried out in phases 1 to 4 increases step by step the Technology Readiness Level²² of the R&D results: initial idea, solution proposal, prototype, pre-commercial product/service (also called pre-product/service), commercially ready product/service. Phases 1, 2 and 3 comprise pre-commercial research and development work. Phase 4 corresponds to commercialisation, the take-up of the first pre-commercially tested products and services by the market.

¹⁹ A new procedure within the context of Directive 2004/18/EC, if implemented by the Member States

²⁰ See the Wilkinson report for a more detailed overview of innovative approaches in practice and procedures of procurement

²¹ Functional or performance based specifications make it easier for the purchaser to express their needs not in terms of specific standards or solutions, but as functional specifications. In this way, the tender does not pre-define the technical solution, but is open to alternative technical ways to address the needs as expressed in the technical specification. The suppliers can therefore propose alternative and innovative technical solutions.

²² Technology Readiness Levels (TRLs) are used widely in the defence/space sector, e.g. by NATO. The TRLs delineate the distance the R&D results are still away from the final TRL which is 'ready for commercial operation' (For a detailed description of the NATO TRLs go to <http://www.saclantc.nato.int/trl.html>). The NATO TRLs can be mapped to the 5 risk levels/TRL levels in Figure 1.

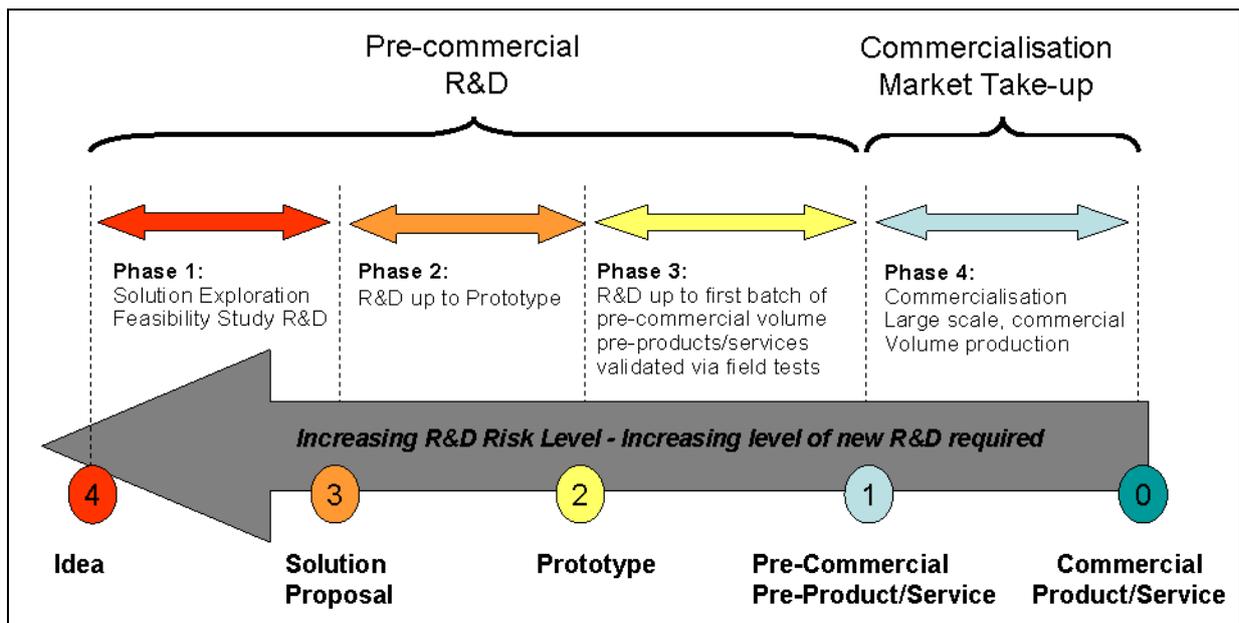


Figure 1: Typical Research and Innovation life-cycle transforming an idea into a product/service

Unlike in the US, **explicit guidance on public procurement in Europe is linked to procuring commercially ready products**. The bulk of government procurements are off-the-shelf products of R&D risk level '0' (Figure 1). By removing some of the barriers that prevent procurers from retaining the more innovative proposals in a commercial tendering process, Innovative Procurement may be able to make open-minded public procurers buy 'innovative' products *for which the financial and technological development risks can be ascertained within controllable limits of uncertainty from beforehand*²³: *pre-products/services of R&D risk level '1'*(Figure 1).

The new features in the 2004 Directives that can stimulate innovation - through so-called Innovative Procurement - are mostly designed to limit *contractual and financial* uncertainties when purchasing for commercial deployment (risk level '1', '0'), not to tackle the *technological R&D* uncertainties associated with purchasing completely from-scratch yet-to-be-developed technologies (risk level '4', '3', '2'). **Innovative Procurement thus ensures the take-up (phase 4) of pre-commercial R&D outcomes which are ready to be commercially deployed (risk level '1')**. Innovative Procurement can indirectly contribute to increased investment in R&D (by encouraging suppliers to step up phase 4 type R&D efforts). In order to raise awareness of the new possibilities for innovation-friendly tendering under the new Public Procurement Directives, Commission Services are preparing a Handbook on Procurement and Innovation.²⁴

2.3.2. The new State Aid Framework for R&D and Innovation – Promoting Risk Taking and Technological Experimentation

For the financing of pre-commercial R&D activities (risk level '4' to '1' corresponding to R&D phases 1 to 3 in Figure 1), the European public sector relies mainly on subsidy type schemes up to now. However, State Aid resources can only be used *proportionally* to the gravity of a *well-identified market failure* if this can not sufficiently be tackled by other less competition/trade distortive policy instruments (e.g. regulatory).

²³ Feedback from IPTS MS interviews: Even the few countries that developed national risk management guidelines (e.g. UK for public-private partnerships) address only financial and management risks, not risk-sharing for technological uncertainty.

²⁴ "Handbook on Procurement and Innovation", due 2nd half 2006, under preparation by DG ENTR, RTD and MARKT Commission Services

Research and Development Activities - especially at European level when requiring cross-border cooperation between Member States - are recognized by the State Aid Framework as market failure, due to the *coordination problems and the nature of innovation as a public good*.

According to the ex-ante rules in the **current State Aid for R&D Framework**²⁵ total official support (sum of community and state financing where these are combined) may not exceed 75% in the case of 'Industrial Research' and 50% in the case of 'Pre-competitive Development' activities. These maximum aid intensities are authorized by the WTO Agreement on Subsidies and Countervailing Measures.²⁶

- '*Industrial Research*' covers planned research of critical investigation aimed at the acquisition of new knowledge useful in developing new products, processes or services or in bringing about a significant improvement in existing products, processes or services.
- '*Pre-competitive Development*' covers the conceptual formulation, design and shaping of the results of industrial research into a plan, arrangement of design for new, altered or improved products, processes or services, whether they are intended to be sold or used, including the creation of an initial non-commercially usable prototype. It does not include the routine or periodic changes made to products, production lines, manufacturing processes, existing services and other operations in progress, even if such changes may represent improvements.

In its consultation on the **new State Aid Framework for R&D and Innovation**,²⁷ due to enter into force at the beginning of 2007, the Commission proposes new measures to promote risk-taking and experimentation

- supporting creation and growth of innovative start-ups (through tax exemptions and subsidies)
- additional flexibility for state aid to risk capital
- expanding the scope of the current state aid rules for R&D

Bonuses for cross border cooperation and dissemination are also foreseen.

The Commission proposes to extend the State Aid R&D definition well beyond today's limit of the first non-commercially usable prototype. The extended pre-competitive development definition, called '*experimental development*', includes:

- the acquiring, combining, shaping and using existing scientific, technological, business and other relevant knowledge and skills for the purpose of producing plans and arrangements or designs for new, altered or improved products, processes or services. These may also include e.g. other activities aiming at the conceptual definition, planning and documentation of new products, processes and services. The activities may comprise producing drafts, drawings, plans and other documentation, provided that they are not intended for commercial use.
- the experimental production and testing of products, processes and services, provided that these cannot be used or transformed to be used in industrial applications or commercially
- the development of commercially usable prototypes and pilot projects, where the prototype is necessarily the final commercial product and where it is too expensive to produce for it to be used only for demonstration and validation purposes

The enlarged State Aid R&D definition covers the first three phases (pre-commercial part) of a typical R&D project life cycle depicted in Figure 1.

3. Pre-commercial procurement

3.1. What is Pre-commercial procurement?

Innovation is the transformation of an idea into a marketable product or service (phases 1 to 4 in Figure 1). Pre-commercial procurement refers to Innovation up to and including a first pre-commercial volume batch of products and/or services validated via field tests. Pre-commercial procurement involves direct public R&D investment in the first three phases (pre-commercial part) of a typical R&D project life

²⁵ Community Framework for state aid for research and development (96/C 45/06).

²⁶ "WTO Agreement on Subsidies and Countervailing Measures", http://www.wto.org/English/docs_e/legal_e/24-scm.pdf

²⁷ "Preliminary Draft Staff Paper on the Community Framework for State Aid for Research and Development and Innovation", 20 April 2006, http://ec.europa.eu/comm/competition/state_aid/others/action_plan/rdi_frame_en.pdf

cycle (Figure 1). Innovative Procurement, corresponding to phase 4 in the typical R&D project life cycle, is a very important complement to Pre-commercial procurement to ensure wide take-up of newly developed pre-commercial R&D pre-products/services. It is clear that pre-commercial procurement involves a higher degree of risk than Innovative Procurement; both in terms of technological risks (require earlier stage R&D, prototyping, testing, etc) and/or in terms of non-technological risks (more uncertain return on investment period, higher risk of uncertainty in cost estimations, etc). The way to get pre-commercial procurement going is to share, not only the risks, but also the benefits of the R&D between procurers and suppliers. This makes Pre-commercial Procurements of Innovation eligible to a certain level of State Aid for Innovation. Depending on the way benefits are awarded to suppliers (in a selective way or not) pre-commercial procurement projects can be designed to include a certain level of state aid or not.

3.2 Why are Innovative Procurement and State Aid instruments alone not enough?

By removing some of the barriers that prevent procurers from retaining the more innovative proposals in a commercial tendering process, **Innovative Procurement** may be able to make open-minded public procurers buy 'innovative' products *for which the financial and technological development risks can be ascertained within controllable limits of uncertainty from beforehand*²⁸ (risk level '1'). Innovative Procurement thus ensures the take-up (phase 4) of pre-commercial R&D pre-products/services which are ready to be commercially deployed (risk level '1'). However, the new innovative procurement features in the 2004 Directives are designed to limit *contractual and financial uncertainties*, not to tackle the *technological R&D uncertainties* associated with purchasing completely from-scratch yet-to-be-developed technologies.

- The more *intensive research* a project still requires, the more difficult it is to objectively compare competitive offers purely on the basis of written (functional specifications) or, exceptionally, oral explanation (competitive dialogue). You need to compare *working prototypes*, validate how new designs work in *real field tests* etc.
- IPR and cost sharing agreements are very powerful means to tackle the technological risks of R&D intensive projects. However there is a lack of Community guidance.

In conclusion, even with the new innovation-related features in the new 2004 Directives, it is not clear from the explicit guidance on European Public Procurement how to turn public procurement into a powerful tool optimized to 'pull' truly innovative R&D projects of risk level '4' to '2' into deployment. Indeed, because of their 'pre-commercial' nature (inability to guarantee final product quality and price) innovative R&D solutions of risk level '4' to '2' can not compete on equal basis with off-the-shelf / ready-made solutions in a framework designed for commercial procurement.

State Aid for R&D on the other hand lacks the involvement of a first buyer as it is a 'technology push' instead of a 'market pull' instrument. In addition State Aid can only be used *proportionally* to the gravity of a *well-identified market failure* in case it can not sufficiently be tackled by other less competition/trade distortive policy instruments (e.g. regulatory). And even then, state aid for R&D is *not designed with the legal and contractual characteristics of a 'purchasing' tool* like Public Procurement.

- Pushing research out on the market without the involvement of a first buyer has been tried in the EU R&D Framework Programme 5 with very mixed results. Public Procurement has the advantage of explicit user involvement from the early stages of the project.
- State Aid for R&D is essentially a co-financing instrument (supplier always covers part of the costs himself) designed to assist firms to carry out R&D in line with company roadmaps, not R&D specifically tailored to meet specific public sector purchasing needs. As public procurement covers 100% of the eligible costs defined in the contract, this entitles the public authority to define as precisely as desired the problem and boundary conditions to be addressed by the R&D as well as concrete milestones and outputs to be delivered. Public Procurement enables procurers to focus the scope of the R&D activities to their purchasing needs. State Aid

²⁸ Feedback from IPTS MS interviews: Even the few countries that developed national risk management guidelines (e.g. UK for public-private partnerships) address only financial and management risks, not risk-sharing for technological uncertainty.

for R&D is the ideal instrument as an assistance mechanism to support bottom-up exploratory research in less narrowly specified research domains.

- An R&D subsidy is essentially a one-way agreement without an obligation for the receiver of the subsidy to deliver a specific result in the end. Procurements are two-way agreements with contractually bound project deliveries.
- Public procurement enables public authorities to take the initiative to start the procedure whenever they want. In case of state aid/subsidy the initiative to make a project proposal and how to specify it has to come from the company, not the public authority.

Conclusion: There is a **missing link in the European Innovation cycle** which is essential to really pull completely new 'yet-to-be-designed' technology research (risk level '4') up to the acceptable risk level 'tested to comply with commercial quality requirements' (risk level '1') suitable for innovative procurements. This missing link is **Pre-commercial Procurement**.

If the whole objective is to use public demand more strategically and very targeted to provide lead markets for new innovative ICT R&D solutions in specific public sector domains, then experience shows²⁹ that a purchasing instrument (Public Procurement) is more effective than a subsidy instrument (State Aid for R&D). State Aid is useful to reward the risk-taking associated with innovation and to encourage coordination and cooperation between Member States, but Public Procurement is needed as the baseline legal instrument for acquiring the new R&D involved with Pre-commercial procurement. Because of the inherent risk-aversion of public procurers, we need a specific strategy for Pre-commercial procurement based on sharing of risks and benefits of the pre-commercial R&D activities. We need specific legal guidance which does not regard pre-commercial procurement as a regular commercial procurement activity but as a separate pre-commercial public purchase which situates itself in the prolongation of the research phase, and which may entail a certain level of State Aid from the public side.

3.3. How to approach Pre-commercial procurement?

3.3.1. The legal basis for a 'European' Programme

The new 2004 Public Procurement Directives, 2004/18/EC and 2004/17/EC, are the legal basis for public procurements by public authorities and utility companies respectively. In order to ensure the opening-up of public procurement to global competition, in respect of the WTO GPA, all procurements above the threshold values defined in the Public Procurement Directives have to be published European wide in the Official EC Journal and the TED³⁰ databank in all official Community languages. Strict procedures have to be followed to make sure that all bidders regardless of nationality are treated equally in the procurement process.

Public service contracts for R&D services are an exception to the Public Procurement Directives, unless the benefits of the R&D are completely for the contracting authority *and* the R&D is fully paid by the contracting authority.³¹ Because of its 'Shared R&D Risk – Shared R&D Benefits' characteristic, pre-commercial procurement falls under this exception. As the definition of R&D in the EU Public Procurement Directives³² falls within the WTO definition,³³ R&D procurements not covered by the

²⁹ Experience from US pre-commercial procurement type programmes (e.g. NASA/DOD and SBIR programmes). EU Experience on the small impact of R&D subsidies on opening up new lead markets for European R&D.

³⁰ *Tenders Electronic Daily*, the European on-line tender database (<http://ted.publications.eu.int/official/>)

³¹ Article 16 (f), Directive 2004/18/EC and Article 24 (e), Directive 2004/17/EC: *'This Directive shall not apply to public service contracts for research and development services other than those where the benefits accrue exclusively to the contracting authority for its use in the conduct of its own affairs, on condition that the service provided is wholly remunerated by the contracting authority.'* This article is applicable in case the value of research and development services exceeds the value of research and development products.

³² The definition of R&D in the EU Common Procurement Vocabulary (Regulation No 2195/2002) includes 'research and experimental development services' as well as 'design and execution of research and development'. The Public Procurement Directives mention explicitly under R&D: research, experimentation, study or development which does not extend to quantity production to establish commercial viability, ensure profitability or to recover research and development costs.

Directives are also not covered by the WTO GPA agreement, and thus openness to competition from outside the EU for pre-commercial R&D procurements is not mandatory. This means that access to the pre-commercial procurement scheme can be limited to European/EEA³⁴ companies³⁵ (in the case of consortia of bidders, limited to consortia lead by a European/EEA company), as in the European Research Programme. In the case of pre-commercial procurement however, the report upon which this article is based proposes to apply a set of participant eligibility criteria different from the ones for the European Research Programme (see chapter 3.3.4). The criterion related to the European/EEA characteristic of the company is not related to the company's principal place of business, establishment or ownership but to the company's commitment to locate the 'centre of gravity' of the relevant R&D as well as operational activities related to the pre-commercial procurement contract in the EEA.

It is important to note that the exception³¹ only applies to R&D contracts of the type 'public service contract',³⁶ meaning that restricting access to European/EEA companies is only possible as long as the total value of the R&D services in question exceeds that of the total value of products and works – if any – covered by the pre-commercial procurement contract. If this requirement is not fulfilled, the pre-commercial process described in chapter 3.3.2 can still be used but without the de facto restriction to European/EEA companies enabled by exception.³¹

Pre-commercial procurement is an R&D procurement of the type 'public service contract' because it refers to acquisition of knowledge – collected by the supplier by carrying out intellectual investigation services (R&D services) consisting of critical solution analysis, prototyping, field testing and small scale pre-product/service development – with the objective to prove the feasibility or unfeasibility to transform a technologically innovative idea into a first working batch of pre-commercial volume and quality pre-products/services according to the requirements in the tender specifications. As the definition of R&D services in the Directives³⁷ ranges from 'research (laboratory) services' through 'experimental development services' up to 'design and execution of research and development', the R&D public service contract can cover all three pre-commercial phases of the typical R&D project life cycle (Figure 1).

Restricting the pre-commercial R&D phase to Europe/EEA will eliminate the competitive advantage some third countries like the US, China, Korea and Japan have today by protecting their pre-commercial R&D procurements to domestic suppliers. It will give European/EEA suppliers equal chances to compete in commercial (innovative) procurements which follow after the pre-commercial procurement process. In contrast to pre-commercial procurement tenders (phase 1 to 3 of the typical R&D life cycle) access to an commercial (innovative) procurement tender (phase 4) can not automatically be restricted to Europe/EEA on the basis of the R&D exception in GPA, as here commercial procurement rules apply. Beyond pre-commercial procurement the degree of required openness to international competition depends on whether the procuring entity and the subject of the procurement contract are covered by the GPA

Although contracts not covered by the Public Procurement Directives are not obliged to European wide tender publication, the fundamental Treaty principles of objectivity, equal treatment and non-

³³ The WTO GPA R&D definition includes research, experiment, study and/or original development. Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. It does not extend to quantity production or supply to establish commercial viability or to recover research and development costs.

³⁴ EEA refers to the European Economic Area (http://europa.eu.int/comm/external_relations/eea/). A more elaborate definition of what is meant by 'European/EEA companies' is outlined in chapter 0

³⁵ EEA refers to the European Economic Area (http://europa.eu.int/comm/external_relations/eea/).

³⁶ Quoting article 1 (definition of public service contract) of the EC Directive 2004/18/EC: 'Public service contracts' are public contracts other than public works or supply contracts having as their object the provision of services referred to in Annex II. A public contract having as its object both products and services within the meaning of Annex II shall be considered to be a 'public service contract' if the value of the services in question exceeds that of the products covered by the contract.

³⁷ According to Annex II of the EC Directive 2004/18/EC under R&D services are classified: 'research services', 'research laboratory services', 'experimental development services' and 'design and execution of research and development'.

discrimination between Member States still apply.³⁸ As fostering of innovation through competition amongst European bidders is one of the main goals of pre-commercial procurement, it is proposed – although it is not mandatory in exception cases to the Directives - to publish calls for tenders at the launch of new pre-commercial procurements as European-wide open procurements, using the 'non-mandatory publication' feature foreseen in the Directives.³⁹

Nothing prevents Member States to develop their own scheme for pre-commercial procurement. The fundamental Treaty principles of non-transparency, objectivity and discrimination are however applicable and thus the procurers have to accept European-wide offers. The tenders have to be published in an 'adequate' way, an obligation which indicates that the exploitation of EC supported research demands a European-wide publication.

In its consultation on the new State Aid Framework for R&D and Innovation,²⁷ the Commission has proposed new mechanisms for supporting innovation, in particular measures encouraging risk-taking and experimentation. The latter is enabled by extending the current State Aid definition of R&D up to the WTO definition of R&D. This enables the Community to reward groups of procurers for taking the risk of procuring not-yet-proven technologies with a risk-incentive for the whole pre-commercial procurement process. In particular for projects addressing an important problem of common European interest such a Community incentive seems appropriate.

3.3.2. Positioning in an end-to-end procurement process geared towards innovation

How does pre-commercial procurement fit into an end-to-end public procurement scheme geared towards innovation? Several schemes and variations of schemes are possible within the legal constraints. In what follows we explain one example of a scheme that we propose to be applied at European level. It should be understood that this is a proposed procedure and not the only possible legal procedure.

The starting point is that a group of European procurers⁴⁰ (called hereafter the Group of Procurers) decide to work together to pool public demand for procuring specific innovative ICT solutions which require new R&D. The Group of Procurers identifies procurement needs with a clear European dimension for which the introduction of new ICT technologies plays an important role in dialogue with stakeholders such as the research community and future end-users.

A. Problem definition, identification and specification of the R&D required

In order to make sure that the procurement takes into account all user requirements from the beginning, the stakeholders assist the Group of Procurers to formulate a common well-specified tender request. The request addresses 'an important problem of common European interest', for which a substantial amount of new R&D is required. The target is to deploy a solution in a timescale of 5 to 6 years. Establishing an explicit communication channel between the Research and Innovation and the Procuring departments in the Group of Procurers helps to raise the number of 'Intelligent Customers': The R&I side informs the procurers about new upcoming promising R&D technological developments with an interesting business case. In return, early feedback from procurers (potential buyers) provides invaluable insights into the effectiveness of the research portfolio. The innovation department can pro-actively use risk-incentives to reward procurers for engaging in pre-commercial procurements.

B. Joint pre-commercial procurement

³⁸ Mentioned explicitly in Public Procurement Directives 2004/18/EC (Article 2) and 2004/17/EC (Article 10)

³⁹ Article 37 in 2004/18/EC allows public authorities to publish notices of public contracts which are not subject to the publication requirement laid down in this Directive in the Official EC Journal.

⁴⁰ In what follows, we continue to speak about public authorities (Directive 2004/18/EC), but the same Pre-Commercial Procurement for Innovation process could be used by utility companies (Directive 2004/17/EC).

To share the risk of 'pulling' the new ICT technologies from the research phase to the first non-commercial volume batch of pre-products/services, the Group of Procurers engages in a "Pre-commercial procurement" process. R&D risks are mitigated on both sides by sharing risks and benefits between procurers (the Group of Procurers) and suppliers (see chapter 3.3.3 for more detail).

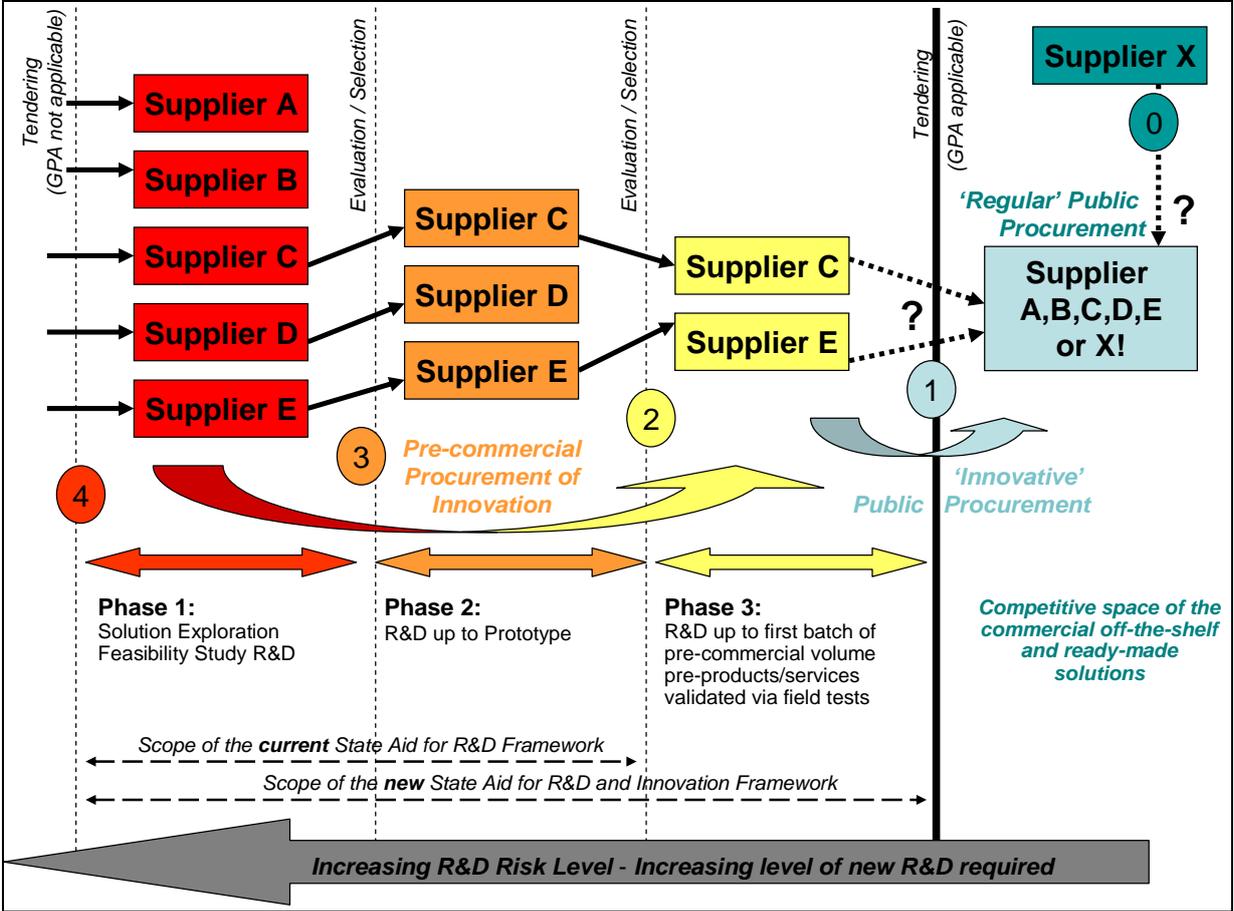


Figure 2: Pre-commercial procurement: A phased shared risk/shared benefit approach

To tackle the technological uncertainties inherent to procuring yet-to-be-developed technology in steps, the working group proposes a three-stage process (Figure 2), each stage with multiple suppliers in competition (like similar programmes in the US):

- **Phase 1:** Solution Exploration / Research (min 3-5 competing suppliers)
- **Phase 2:** R&D up to Prototype (min 2-3 competing suppliers)
- **Phase 3:** R&D up to first pre-commercial volume batch of pre-products/services validated in a field test series (min 2 competing suppliers)

At the end of phase 1 and phase 2 an evaluation filters out the best projects based on their performance in the previous phase and the 'quality' of the project proposal for the next phase. The 'quality' criterion assesses the project's degree of technological innovation, commercialisation potential and the ability to address the problem of public interest posed in the tender. Once the three-step process is started, normally no other suppliers would be asked to submit offers. For each of the three phases of the pre-commercial procurement process a fixed price is predefined in the initial tender publication. The companies are bidding in competition based on a joint tender request from the Group of Procurers.

Technically speaking the three-stage pre-commercial procurement process is implemented as a single public procurement procedure – of the type 'Public service contract for R&D services' – with two

intermediate evaluation points. The definition of R&D services in the Directives⁴¹ ranges from 'research (laboratory) services' through 'experimental development services' to 'design and execution of research and development', thus covering all three phases of the pre-commercial procurement process.

Figure 2 shows the life-cycle of a project that starts from scratch, from the early research stage of solution exploration. In cases where state-of-the art research in the Community has already progressed beyond risk-level 4, the pre-commercial process does not have to be started at phase 1, but can start at phase 2 or even at phase 3.

The process proposed in this chapter is an example of a scheme for pre-commercial procurement which falls within the legal framework. Although it is possible that Member States develop other alternatives or variations on this proposal, the working group proposes that Member States follow the process described in this chapter, as a common approach across Europe would be welcome.

To encourage an organic wave of innovativeness in the supplier base, market demand is pooled up to contract values that trigger supplier imagination. Nevertheless, to make sure that the pooled market demand also opens opportunities for SMEs, the Group of Procurers requires and helps suppliers to advertise parts of the contract which can be subcontracted to SMEs.

To make sure that the exercise results in products and/or services that can be deployed in 5 to 6 years, the three consecutive phases in the pre-commercial procurement process each have a well-specified focus and a limited duration.

- The aim of Phase 1 (~ 6 months) is to verify the technical, economic and organisational feasibility of the proposal against the pros and cons of potential alternative solutions, as well as its ability to solve the problem of public interest. The output of phase 1 includes a technology evaluation, as well as an organisational plan (how to plan the R&D in phase 2) and an estimate of economic impact of the proposed solution (development costs versus market potential).
- In Phase 2 (~ 2 years) the actual development starts, up to the realisation of a first not yet commercially usable prototype. The main outputs of phase 2 are a product specification, a tested prototype and a production plan (limited production). In phase 2 the preliminary business plan of the company is also scrutinized.
- In Phase 3 (~ 2 years) research and development continues beyond the first prototype up to a first batch of pre-products/services (pre-commercial volume production) that are validated through field tests and *original development*. Quoting the terminology used in WTO GPA rules for the last stage of pre-competitive R&D falling under the WTO R&D exceptions: "*Original development of a first product or service may include limited production or supply in order to incorporate the results of field testing and to demonstrate that the product or service is suitable for production or supply in quantity to acceptable quality standards. It does not extend to quantity production or supply to establish commercial viability or to recover research and development costs*". In step 3 the companies are evaluated also against their full business and production plans (for full scale volume production), marketing and communication plans as well as their ability to attract interest from investors/first buyers. This last evaluation criterion assures the take-up (diffusion) of solutions at the end of phase 3 into commercial operation. This ensures the link between Pre-commercial procurement (risk level '4' to '1') and Innovation Procurement (risk level '1' to '0').

The three consecutive steps are a learning process, for the suppliers as well as the potential buyers. It enables the potential buyers (the Group of Procurers) to evaluate the pros and cons of the proposals from different suppliers. Each step helps the Group of Procurers to adapt and fine-tune the requirements for the common specifications, which they all agree should form the basis of any subsequent commercial procurement for the rollout of the final product/service. In the final pre-commercial procurement phase 3 at least two contractors would remain to ensure a future competitive market.

⁴¹ According to Annex II of the EC Directive 2004/18/EC under R&D services are classified: 'research services', 'research laboratory services', 'experimental development services' and 'design and execution of research and development'.

C. Innovative Procurement of the commercial solution according to common specifications

After the pre-commercial phase is concluded, the solution is commercially ready to compete in a commercial procurement. When found suitable, the public authorities in the Group of Procurers can now act as first buyers, individually or collectively, for the solution based on the technologies developed in the pre-commercial phase by launching a procurement procedure based on the common specifications, e.g. by using an open or restricted procedure.

Organisationally speaking, it is up to the public authorities to organise themselves in the format best suited for their specific sector to launch the commercial procurement procedure based on common specifications. Different formats are possible: joint procurement via a common procurement agency, synchronised procurements by each public authority in its own country, procurement initiated by one of the public authorities of the Group of Procurers in the name of others in the Group of Procurers.

At this stage of procuring the final commercial solution it is essential that Innovative Procurement practices - such as the use of functional specifications - are applied to give new R&D pre-products/services equal chances in the commercial procurement process. Removing barriers that prevent procurers from retaining the more innovative proposals in a commercial tendering process are extremely important to ensure take-up of the new R&D products/services developed in the pre-commercial phase.

At the launch of the commercial procurement process it should be ensured that all bidders (including external suppliers X and suppliers A, B and D that participated in the pre-commercial procurement process but not up to the last phase 3) have equal opportunity and equal level of information to bid compared to the suppliers C and E that participated in all three pre-commercial procurement phases.

In what follows we concentrate on part B, the focus of our work, the Pre-commercial procurement phase.

3.3.3. A Shared Risk – Shared Benefit approach

Where regular procurement is *the instrument* for 'Take No R&D Risk Unless Collect All Benefits' type of public purchases, Pre-commercial procurement is specifically tailored for a 'Shared R&D Risk - Shared R&D Benefit' approach.

To share the risk of 'pulling' the new ICT technologies from the research phase to the first batch of non-commercial volume products, the Group of Procurers engages collectively in a "Pre-commercial procurement" process. R&D risks are mitigated on both sides by sharing risks and benefits between procurers (the Group of Procurers) and suppliers.

Shared R&D Risks

Risk-sharing between procurers and suppliers

The pre-commercial phase gives the supplier an 'option' on full-scale commercialisation of his R&D efforts down the road. According to financial analysts⁴² this 'option' has a value for the supplier which is a function of time, the upside commercialisation potential and the downside risk that the project will not be well received in the market. When making investment decisions (when suppliers compare different R&D projects to invest in) the value of this option determines the maximum amount of money that a company can spend on the pre-commercial R&D project. For projects targeted at private buyers the upside valorisation potential and downside risk are well balanced (probabilities are more or less equal).

⁴² Real Option Analysis is the financial theory referred to here.

"Hybrid real options valuation of risky product development projects", J.E. Neely, R de Neufville; Int. J. Technology, Policy and Management, Vol. 1, No.1, 2001

"Making Real Options Really Work", A.B. van Putten and Ian C. MacMillan; Harvard Business Review, december 2004, p 134

For projects targeted at the public sector however, risk aversion of public procurers limits⁴³ the upside valorisation potential (uncertainty in the operational cash flow the supplier can expect), and thus limits the supplier's option/prospects on full-scale diffusion and commercialisation, and thus limits his willingness to invest in public goods and services. The distortive effect between the balance of upside potential and downward risk for the suppliers is the greatest in direct public procurement⁴⁴ (procurement addressing needs *intrinsic* to the procuring organisation, e.g. e-government services), but is also present to a lesser extent in cooperative procurement (procurement based on *shared needs*, congeneric to multiple users, e.g. energy efficient lighting or buildings) and catalytic procurement (procurement based on needs *extrinsic* to the procuring organisation, needs of other users, e.g. new sustainable technologies). The only solution to resolve this deadlock situation is that procurers that have concrete yet-to-be-developed technology needs reach out to the supply side to share the investment risk of a well-defined pre-commercial R&D project (using public procurement instead of a subsidy instruments).

Subsequent risks for the suppliers

The risks for the suppliers are related to the fact that the value of the R&D 'option' is smaller when targeting a public sector customer than when targeting a private sector customer, and this while the R&D costs for the supplier are the same in both cases. The degree to which procurers share the R&D risks with suppliers may vary based upon the degree of distortion caused by the different types of public procurement⁴⁴ on the balance between the valorisation potential and downward risks for the suppliers. As contracts are awarded to suppliers on the basis of predefined fixed prices for the three phases, these fixed prices may not always cover all the costs actually incurred by the suppliers for delivering the requested R&D services. Extra costs not covered by the fixed prices have to be born by the suppliers. Especially in phase 1 and 2 the contract value will not cover the costs of building up the knowledge, experience and insight in the R&D domain, costs which the supplier incurred before the pre-commercial procurement process. In addition suppliers take the risk that after each phase, at each evaluation/selection point, the Group of Procurers can stop the process or modify the R&D requirements for the next phase based on the lessons learned in the previous phase. As the market potential behind the innovative technologies in the bidders' proposals is an important evaluation criterion in assessing the R&D risks and rewards of the pre-commercial procurement process, the suppliers also take the risk to share with the Group of Procurers their business plans for commercialising the new products and solutions being developed during the process.

Subsequent risks for the procurers

Pooling public procurement resources together enables procurers in the Group to share the risks of procuring yet-to-be proven technology and to reduce R&D cost (larger volumes due to pooled demand). In concreto, risk sharing between the procurers in the Group translates itself into sharing the price of the R&D services performed by the suppliers (the predefined fixed prices for the three phases of the pre-commercial procurement process). Due to the natural risk-aversion in the purchasing behaviour of procurers, risk-incentives will be indispensable to turn public procurement into a strategic tool for procuring innovative ICT solutions on a big enough scale around Europe to break the economy of scale barriers. The Community may top up a risk-incentive to reward the risk-taking by Groups of Procurers engaging in this new type of procurement of not-yet-commercially proven technologies, especially for projects addressing an important problem of common European interest. Nothing prevents Member States from implementing in addition their own incentive schemes.

Shared R&D Benefits

Benefits for the procurers

All public authorities participating in the Group of Procurers benefit equally from the shared vision which is built up during the pre-commercial procurement process regarding the potential of the newly

⁴³ "Real Options: a new financial instrument in the assessment of the potential of high risk innovation", presentation at Vlerick Ghent, Peter Thevissen, November 2004

⁴⁴ Professor Hommen (Sweden) distinguishes between: direct procurement (based on needs intrinsic to the procuring organisation, e.g. e-government services), cooperative procurement (based on shared needs, congeneric to multiple users e.g. energy efficient lighting or buildings), catalytic procurement (based on needs extrinsic to the procuring organisation, i.e. needs of other users e.g. new sustainable technologies).

developed technologies to address the problem of public interest. However, in contrast with regular commercial procurement practises in Europe, it is recommended that the contracting authority (the Group of Procurers) does NOT assume all the benefits of the pre-commercial R&D procurement.

This can be ensured by:

- Publishing widely the press announcement with the main outcomes of the project after completion of phase 3 of the pre-commercial procurement process
- Not assigning the IPRs 100% to the Group of Procurers (but e.g. 100% to the suppliers)
- Contributing to European standards bodies wherever R&D results are of European interest
- Allowing suppliers to commercialise new products/services resulting from the R&D independent from the Group of Procurers (e.g. by attracting external funding from VCs for full scale production)

The proposal is to apply the above actions both for direct, cooperative and catalytic public procurement⁴⁴. For the last two types of procurement, it is clear that the procuring authority assumes even less direct benefits of the R&D. The most extreme cases where the public authority does not take all benefits of the R&D are the cases where the public authority financing the pre-commercial development is not the one finally buying and/or implementing the newly developed products/services. It may well be that it is another department than the one financing the pre-commercial R&D which ends up being the customer of the final product or service (e.g. department of public health financing a new water protection/inspection system which ends up being bought by the water utility companies). It may also be that the public authority financed the R&D of technologies that will never be bought by public authorities, but that nevertheless contribute to its policy goals (e.g. ministry of environment procuring cleaner exhaust filters to be bought, installed and commercialised by car manufacturers). In case the public authority *does* buy the final product of the R&D, the proposal is that the only real tangible benefit which the Group of Procurers requests from the suppliers is license-free use of the technologies and solutions protected by IPRs acquired during the pre-commercial procurement process.

Benefits for the suppliers

Suppliers benefit from the pre-commercial procurement process as it delivers them early feedback – right from the beginning of the R&D – from potential customers about the technological and commercial strong and weak points of their solution. The stepwise character of the pre-commercial process also allows the suppliers to adjust / fine-tune their development and business plans along the way step by step. Even suppliers that fall out the pre-commercial competitive process somewhere along the road, have gained important insight on the market potential and technology maturity of their ideas.

3.3.4. The participants

Who can participate in the pre-commercial procurement process? In order to create a programme with equal competitive power as similar pre-commercial procurement schemes in the US (e.g. DARPA/NASA and deduced programmes⁴⁵), we propose that contract bidders satisfy the following eligibility criteria on the date of the contract award for phase 1, 2 and 3:

- for-profit organisation
- EEA based R&D centre of gravity
- principal researcher employed by proposing firm
- no double funding

The first three criteria are essential to ensure that sufficient knowledge and technologies developed in the course of the R&D work remain concentrated

(1) in the European Economic Area (to ensure coupling between supply and (public) demand side), and
(2) in a firm (to ensure that there is enough ambition and potential to commercialise the products and services resulting from the R&D, thereby contributing to the creation of new lead markets for Europe).

For profit means that the main bidder submitting the offer has to be a firm, not a research institution (in case of a start-up SME, the SME has to be at the minimum registered as a company). With a firm is

⁴⁵ SBIR = Small Business Innovation Research Programme (<http://www.sba.gov/sbir/>) is a 3 phase multi-competitor programme also based on DARPA/NASA multi stage multi-competitor R&D procurement programmes.

meant an enterprise in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative. The proposing firm is allowed to cooperate with or subcontract work to research institutions or other companies (even outside the EU) under the conditions that for:

- Phase 1: at least 2/3 of the research and/or analytical work is carried out by the proposing firm
- Phase 2: at least 1/2 of the research and/or analytical work is carried out by the proposing firm
- Phase 3: at least 1/2 of the R&D work is carried out by the proposing firm

The contract will be in the name of the main proposing firm. The proposing firm is required to specify in the offer all the parts of the contract that will be subcontracted and/or will be developed in cooperation with other partners. The proposing firm is encouraged to cooperate with European SMEs for the parts of the contracts that it does not intend to carry out itself.

EEA based R&D centre of gravity means that the part of the R&D work carried out by the main bidder (in case of zero subcontracting or zero cooperation with other partners this part equals 100%) has to be carried out in one or more of the main bidder's R&D centre(s) in the EEA. Proposing firms that do not have an R&D centre located in the EEA are not eligible. In contrast to similar pre-commercial procurement programmes in the US and some Asian countries, the working group does not recommend that the main bidder's operated principal place of business has to be located in the European Union, nor do we recommend a requirement of 51% European ownership of the proposing firm. As such conditions have had negative effect infringing competitive conditions, we recommend instead to award contracts only to proposing firms that are committed to locate the 'centre of gravity' of the relevant R&D as well as operational activities related to the contract in the EEA.

To guarantee that sufficient knowledge acquired in the course of the R&D work in the project remains in the bidding firm, *the principal researcher* responsible for, and/or carrying out, the main portion of the R&D work in the project has to be *employed by the main bidder's firm* for at least 50% of his time.

Excluded are project proposals that already receive another form of financial support / subsidy from one or more public authorities.

It should be understood that this is a proposal. Member States can develop other alternatives or variations on this proposal, although a common approach across Europe would be welcome.

4. Conclusion

This article for the first time clearly legally separates pre-commercial from commercial public procurement in the context of international WTO and European law.

Pre-commercial procurement is an untapped opportunity in Europe which enables public authorities to steer industrial product development from the early pre-commercial R&D phases to their specific needs. Shaping the right solution at the best cost is done by pooling efforts with other procurers and sharing with the suppliers the risks and benefits of designing, prototyping and testing new products and services. By acting as technologically demanding first buyers, public procurers drive innovation from the demand side and create opportunities for European companies to take international leadership in new markets. Reducing time to market by developing a strong European home market for innovative products and services is key for Europe to create growth and jobs in quickly evolving markets such as ICT.

This article presents a first analysis of how pre-commercial procurement can practically be implemented in accordance with the legal boundaries and proposed a three-phased implementation scheme. Triggered by the report upon which this article is based, the European Commission is conducting an official validation of the legal basis for pre-commercial procurement. Up-to-date information about pre-commercial public procurement including information and networking opportunities for public procurers can be found at: http://ec.europa.eu/information_society/research/vienna_process/pre_commercial_procurement/index_en.htm