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PUBLIC PROCUREMENT OF INNOVATIVE SCIENCE AND TECHNOLOGY SOLUTIONS



PREPARED FOR MATRIX BY

THE NORTHERN IRELAND SCIENCE INDUSTRY PANEL

MATRIX is key to the development of Northern Ireland's future knowledge-based economy and will play a key advisory role in the formulation of R&D and Innovation policies.

A key objective for MATRIX is the successful development and implementation of HORIZON it's flagship programme tasked with carrying out focussed foresight exercises.

MATRIX

NORTHERN
IRELAND
SCIENCE
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EXECUTIVE SUMMARY

Distinct from the Horizon Programme, MATRIX has conducted a study into the use of public procurement as an instrument to find and implement innovative solutions to issues faced by the public sector. This tightly focused study has been undertaken by a sub-panel of MATRIX with expert advice and support from SQW Consulting (SQWC).

The study focused on two strands, namely:

- A review of Government policy to use public procurement to encourage SMEs to increase their levels of R&D and science and technology innovation;
- An investigation of the potential for establishing a targeted small scale pilot in a distinct high technology area e.g. ICT or Medical Services in order to demonstrate best practice.

In recent years there has been growing recognition on the part of governments in the UK and elsewhere in Europe as well as the European Commission of the potential value of using public procurement as an instrument to find and implement innovative solutions to issues faced by the public sector and to fund small, early-stage companies with ideas for such solutions. The successful Small Business Innovation Research (SBIR) programme in the US is universally recognised as the main inspiration for this. The SBIR provides for a phased programme of funding for investigating new ideas and developing the most promising ones with a view to producing proven, market-ready solutions that can be taken up by the public sector as well as taken to the wider commercial market.

The UK equivalent, the Small Business Research Initiative (SBRi) does not include such funding and essentially consist of a voluntary target for participating Government Departments to spend 2.5% of their R&D requirements from SMEs. This has not had the desired effect because it has led to very few, if any, technology development

opportunities. This has been recognized in, among other reports, the Sainsbury Review. Various measures aimed at improving the situation have been proposed and some have been implemented. However, none address the fundamental issue that public procurement is of necessity a risk-averse process that is incompatible with the risks caused by technological uncertainty and the early-stage nature of small innovative companies.

The situation is very similar throughout most of Europe. However, in 2006 an ad-hoc working group of the National IST Research Directors Forum proposed a three-stage mechanism it called Pre-commercial Procurement of Innovation, which is very similar to the US SBIR approach. The paper concluded that a substantial proportion of the SBIR process could be implemented in Europe within the limitations imposed by State Aid regulations and Procurement (competition and anti-discrimination) Directives.

Two years prior to the publication of this paper, the Dutch Government had already started a pilot version of the SBIR designed along very similar lines, which is still ongoing and is managed by SenterNovem, an executive agency of the Ministry of Economic Affairs. Although European rules mean that the Dutch version has to allow Europe-wide competition at key stages of the process, the experience to date has shown that this does not necessarily detract from the objective of working with ideas from small innovative Dutch companies and funding the development of the most promising of those ideas. This pilot is currently at the stage where a number of the initial ideas are being developed into non-commercial prototypes. The intention is to involve larger companies as prospective customers and investors in the third and final phase where prototypes are developed into commercial products.

There is the potential for implementing a similar

pre-commercial procurement pilot in Northern Ireland, with Departments that have a need for innovative solutions and access to budgets to support the development of such solutions and ultimately to procure them. Possible candidate Departments include the Department of Health, Social Services and Public Safety (DHSSPS), the Department of Agriculture and Rural Development and the Department of the Environment. In the Health and Social Care sector, the appropriate parties to implement a pilot would include the Central Services Agency (the Centre for Procurement Expertise for health supplies and services), HSC Innovations (the innovation management and IP exploitation centre for the Health Service), Biobusiness Northern Ireland (the business association for the Life and Health Technology sector), the MATRIX Health & Life Sciences Horizon panel and the HSC Research Office, which funds healthcare research.

An indicative minimum budget for a pilot would be £750,000 plus management costs (5-10% of the project budget), to cover at least four Phase 1 projects with an indicative budget of £35,000 each and at least two Phase 2 projects with an indicative budget of £300,000 each. The final development of a commercial product would then be funded by private sector companies with an interest in the outcomes. A full pilot would probably take around five years from the first preparations to producing procurement-ready products. Special consideration would need to be given to early engagement with prospective providers of solutions, to the involvement of large companies as prospective users and investors and to the management of Intellectual Property Rights.

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INTRODUCTION





1.1

SQW was commissioned by the Department of Enterprise, Trade & Investment (DETI) of the Northern Ireland Government to provide support to the MATRIX Procurement Panel in its deliberations on how government procurement in Northern Ireland can best stimulate economic return from the commercial exploitation of the local research, science and technology (S&T) base, especially through SMEs.

1.2

The MATRIX Procurement Panel is a panel established by MATRIX, the Northern Ireland Science Industry Panel. MATRIX is itself an expert advisory panel reporting to DETI and the DETI Minister on policies and strategies designed to maximise the region's abilities to gain economic advantage and generate wealth from the exploitation and commercialisation of science, technology and R&D. The MATRIX Procurement Panel (the Panel) consists of representatives of MATRIX, business representation organisations and Government.

1.3

Following the inception meeting with the Panel, it was agreed that the study would focus on two strands, namely:

- A review of what has been done in terms of overall Government policy to use public procurement to encourage SMEs to increase their levels of R&D and science

and technology innovation. This includes exploring a number of examples of best practice including the US Government's SBIR, the use of bonds by SMEs in Spain to help them bid for Government contracts and the example of clusters competing for contracts in Finland;

- The main focus should be an investigation of the potential for establishing a targeted small scale pilot in a distinct high technology area e.g. ICT or Medical Services in order to demonstrate best practice.

1.4

A number of policy and guidance documents, papers and websites on the subject were reviewed in order to ascertain the current status of UK Government policy and practice and to assess the relevance of policies and practices elsewhere in Europe and the rest of the world. Where appropriate, information of particular interest was followed up. A full list of all references is provided in Annex A.

1.5

Discussions were held with a number of individuals in key organisations within Northern Ireland in order to assess the potential for a pilot project, focusing on the Health and Social Care sector in particular. A list of consultees is provided in Annex B.



REVIEW OF GOVERNMENT POLICY AND PRACTICES IN THE UK AND ELSEWHERE





THE US SBIR

2.1

In recent years, there has been growing recognition on the part of governments in the UK and elsewhere in Europe, as well as the European Commission, of the potential value of using public procurement as an instrument to find and implement innovative solutions to issues faced by the public sector and to fund small, early-stage companies with ideas for such solutions. The successful Small Business Innovation Research (SBIR) programme in the US is universally recognised as the main inspiration for this¹.

2.2

The benefits that the SBIR programme brings to both the public sector and small innovative businesses have been extensively described elsewhere (see for example references 1 and 2 in Annex A) and will not be repeated in detail here. However, for the purpose of identifying other exemplars and devising a suitable pilot scheme for Northern Ireland it is important to consider the key characteristics and success factors of the scheme, which are as follows:

- Funding is made available in a phased approach that initially covers feasibility studies (undertaken by a number of different small companies with a maximum budget of \$100,000 per study), then takes successful projects into a development stage (maximum budget \$750,000) and finally brings successfully developed projects into the actual

mainstream procurement processes.

This helps the public sector to manage the risk of funding speculative new ideas and enables very small companies to participate. In fact, the US SBIR programme does not require companies to be established until awards have been won.

- The programme provides fully funded R&D contracts with specific milestones and deliverables based on the real needs of the public body that wishes to undertake the ultimate procurement of the final product, not part-funded R&D grants. The relationship involved is therefore one between supplier and customer and the development is market-led.
- The Intellectual Property developed within the projects, remains owned by the companies involved, although obviously the public sector receives certain exploitation rights. The public sector is therefore a first customer of the solution developed, but by no means the only potential customer.
- Continuous discussions between interested companies and the managers who administer the programme are encouraged. This helps to inform the companies of future requirements and opportunities and helps the procurement managers to learn what innovative solutions the market may be able to offer.
- The tendering and award processes are based around competitions at roughly

six monthly intervals. They are fully transparent and standard contracts are used.

¹ The closely related but much smaller Small Business Technology Transfer (STTR) Programme is specifically for projects involving significant collaboration with a non-profit research institution. The STTR was not explicitly included in this study because it is much closer to existing UK schemes than the SBIR is.

DEVELOPMENTS IN THE UK

2.3

Unlike the US SBIR, the UK equivalent, called the Small Business Research Initiative (SBRI), is a voluntary scheme under which participating Government departments will aim to buy at least 2.5% of their R&D requirements from SMEs. Data is provided on the website of the Department for Business, Enterprise & Regulatory Reform (DBERR) to show that in 2005/6 all departments except the Department of Health exceeded this target and an average of 8.7% of the baseline budgets was spent with SMEs. However, the website provides little information about the nature of the contracts and the size and stage of development of the SMEs involved, and an unpublished analysis by David Connell (advisor on this report) of the 150 SBRI contracts advertised so far, shows that only one was a genuine technology development opportunity for a business.

2.4

It is now widely recognised that the SBRI is not performing satisfactorily, and the subject of how public procurement can be more effectively mobilised to support innovation has been receiving increasing attention in UK Government circles. In a presentation on the importance of science to the Cambridge Rotary Club on 25th October 2007, Sir David King, Chief Scientific Advisor to the Government, explicitly mentioned that more should be done to stimulate the public procurement of solutions

based on new science and technology ideas. In his recent review of the Government's science and innovation policy (ref. 3), Lord Sainsbury mentions that 'Demand-side factors, such as procurement and regulation, which can play a critical role in encouraging innovation, have received too little government focus. The Review shows that value for money and innovation can be complementary objectives in government procurement and urges government departments and the economic regulators to engage in emerging technology development in collaboration with the Technology Strategy Board (TSB).'

2.5

Lord Sainsbury endorses David Connell's report (ref. 1) and concludes that the SBRI should be reformed to resemble the US SBIR more closely. He also 'welcomes the 'Transforming Government Procurement' report (ref. 4) and recommends that the Government urgently press ahead with plans to improve procurement capability.' However, this latter report only discusses relatively minor changes to existing procurement practices. The same approach is evident from a broader review of policy and guidance documents issued by UK government bodies (primarily the Office of Government Commerce) and European sources on the subject of how the UK or Europe could use public procurement to achieve the kind of outcomes achieved by the US SBIR (references 5-15). The recommendations that

are most often put forward are:

- Early engagement of suppliers by procurement bodies (this is often referred to as 'Concept Viability' or 'Competitive Dialogue') in order to alert prospective suppliers, as early as possible, to potential tendering opportunities, help develop procurement policy and strategies and inform the public sector about new innovative solutions.
- The use of whole-life costing, to take into account the total costs and benefits (including the wider benefits to society beyond the body that is procuring the solution) over the lifetime of the product or service procured.
- The use of outcome-based procurement that avoids focusing too early on particular solutions and leaves open opportunities for entirely new ways of solving the issues in question, and allows variant bids.
- Aggregating demand between public bodies in order to create large enough demand to stimulate innovation.
- Allowing the transfer of Intellectual Property to suppliers, enabling the wider commercialisation of the innovations.
- Adjusting targets and incentives for procurement staff to encourage the procurement of innovative solutions.

2.6

These recommendations are arguably sensible and, if implemented, likely to have a positive

impact on the procurement of recently developed products that are still in the early stages of their market introduction. It is assumed that such guidelines are already being taken on board by the procurement bodies in Northern Ireland. However, they are still based on the assumption that the solutions are ready to be tested and procured, and they do not adequately address a key issue that prevents the public procurement of truly innovative solutions from early-stage companies, namely that of the risks caused by technological uncertainty and the early-stage nature of the companies.

2.7

When a truly novel, innovative solution to an issue is proposed there is inevitably a significant probability that it will in fact not work. New ideas are by definition untested and there are many unknown factors that will determine whether the idea can ultimately be translated into a reliable product, process, system or service. Also, they are often conceived by early-stage technology companies that lack the necessary track record (not only of the company itself but often also of the founders) that inspires confidence that the company will survive for long enough to allow its technology to be implemented. This is recognised by, for example, venture capital investors, who accept a high failure rate of their investments and have learnt to manage risk by, among other things, spreading it.

2.8

By contrast, public procurement practices and the officials who apply them are frequently criticised for being risk-averse and unwilling to procure any products, processes, systems or services that are not tried and tested and available 'off the shelf'. Such reluctance to take risks is understandable because high technological and implementation risk is basically incompatible with the core concept of public procurement, which is value for money. Procurement officers do not have the luxury of spreading their contracts over many different companies but need to select one that offers the best value for money, but it is extremely difficult, if not impossible, to assess that value properly if there is a high probability that the solution offered will never work at all. No amount of targets and incentives will address this unless much more fundamental changes are made to the entire procurement process.

2.9

Similarly, concepts such as 'competitive dialogue' will do little to address the issue of risk because they are intended 'to identify and define the means best suited to satisfying [the contracting authority's] needs'. Again it is very difficult to select the 'best suited' means when all of the proposed means have a high chance of failure.



DEVELOPMENTS ELSEWHERE IN EUROPE

2.10

Few countries in Europe appear to have moved beyond the stage of considering changes to standard procurement practices that are only ever likely to have a minor impact. Even initiatives to encourage or facilitate the participation by small companies in government procurement, in general, are very limited. In our desk research, specific attention was paid to Spain and Finland, which were believed by members of the Panel to have implemented certain practices that supported SMEs in their efforts to participate in procurement opportunities, but no evidence of this was found. In fact, in a survey reported on the website of the Public Procurement Network (see ref. 24e), a Europe-wide network of public procurement officials, every member except Greece and the Netherlands answered 'no' to the question 'is there in your country a regulation that favours or benefits SME's (small or medium enterprises), for example by an obligation or otherwise (like contracts below certain thresholds are only for SME's or 25 % of all contracts by a contracting authority have to be awarded to SME's)?'

2.11

The member from the Netherlands did not provide an answer to this question and the answer from Greece was: 'Yes, there is a regulation as regards works and research contracts that favours SME's through the obligatory registration of companies in classes

depending on their size and the level of the budget of contracts sought. Thus, lower class registered companies can participate in competitions for contracts of lower budget where other, in higher-class registered companies may not.' It may be that this approach is based on the EU de minimis rules, which allow aid of up to €100,000 per company on a rolling three-year basis. We have asked the relevant contacts in Greece for clarification but have not yet received a response, but we assume that this is an implementation of the European Commission's de minimis rules that allow small amounts of State Aid.

2.12

Defence procurement is subject to certain exceptions to standard procurement rules, and the French government utilises this to allow SMEs to directly conclude an R&D contract with the Ministry of Defence without having to face competition with other companies, provided the SMEs can prove that they are the originators of the innovative technology (see http://trendchart.cordis.lu/tc_datasheet.cfm?id=8658). It is unlikely that such avoidance of the competition rules would be acceptable in any area outside of defence, and since the Northern Ireland Government does not have its own defence budget it is of little relevance.

THE PRE-COMMERCIAL PROCUREMENT MODEL

2.13

An ad-hoc working group of the National IST Research Directors Forum (a group of ICT directors from European national administrations, ref. 16) has gone a significant step further by proposing a mechanism it calls 'pre-commercial Procurement of Innovation', which essentially is an extra step through which innovative ideas can be made 'procurement-ready'. The paper provides a thorough analysis of the whole issue (albeit focused around ICT), some useful insights into the relevant regulations as well as a proposal for one way in which such pre-commercial procurement of innovation could be realised.

2.14

The model proposed is similar to the US SBIR approach, in that it puts in place a separate multi-stage process that takes place prior to, and feeds prospective solutions into, mainstream commercial procurement. It recognises that mainstream procurement, even with modifications to make it more 'innovation-friendly', is not able to support the speculative development of technologically risky propositions and that standard grant mechanisms for supporting R&D are insufficiently market-driven and also subject to State Aid rules that limit the level of public sector support. It therefore proposes that early-stage ideas are supported through the procurement of pre-commercial R&D services.

2.15

The proposed mechanism uses the fact that procurement of (as opposed to grants for) R&D is not subject to the State Aid limitations that are imposed on R&D grants, and can therefore, in principle, be fully funded (ref. 17). At the same time, the procurement of pre-commercial R&D services is exempt from Public Procurement Directive 2004/18/EC and therefore does not have to be announced through the Official Journal of the European Union and Tenders Electronic Daily, unless the benefits of the R&D are completely for

the contracting authority and the R&D is fully paid by the contracting authority (ref. 18). This condition can be met by ensuring that the outputs of the R&D ultimately become available to others.

2.16

The paper splits the pre-commercial procurement of innovation into three steps. Depending on the level of technological uncertainty that exists among prospective solutions to a particular issue, the authors suggest that it is possible to skip the first or second of these steps:

- 1 R&D to take an idea, explore its feasibility and develop it into a solution proposal. The level of technological risk at this stage is high. Duration around 6 months.
- 2 R&D to take the proposed solution up to a prototype. The technological risk here is lower than in the first step. Duration around 2 years.
- 3 R&D to take the prototype up to a first batch of pre-commercial-volume preproducts/services validated through field tests. Duration around 2 years.

2.17

The paper discusses the definition of R&D as defined in the new 'Framework for State Aid for Research and Development and Innovation', which was adopted by the European Commission in late 2006 and was due to be implemented on 1st January 2007. This new framework extends the scope of R&D to become 'R&D&I', which includes 'experimental development', and the paper argues that therefore all three steps in the pre-commercial procurement process fall under the exception to the Procurement Directives. However, the Dutch government in a pilot of its own SBIR programme (see below) has concluded that the new definition does not encompass the third step but that it merely allows the second step to be extended further down the development path, but not to the point where a market-ready product has been obtained.

2.18

The text of the new State Aid Framework (ref. 17) is somewhat ambiguous but, among other things, states that 'the experimental production and testing of products, processes and services are also eligible, provided that these cannot be used or transformed to be used in industrial applications or commercially.' Also, the paragraph in the Framework that covers procurement uses the term 'R&D' rather than 'R&D&I', which suggests that in the context of procurement the new definition may in fact not be applicable. In any event, the actual status of the new State Aid Framework is unclear because although it has been 'adopted' by the European Commission it does not appear to have filtered through to the implementation stage.

2.19

A similar 'procurement readiness' mechanism was proposed for the UK in a recent paper on innovation and public procurement by the CBI and QinetiQ (ref. 19) that recommends the creation of a UK equivalent to the US Defense Advanced Research Projects Agency (DARPA), which is a body that coordinates and funds innovative, high-risk projects to make them ready for defence procurement.

2.20

The CBI/QinetiQ paper suggests that the Technology Strategy Board in the UK could be repositioned to undertake this kind of role - not just aimed at defence - and engage in precommercial procurement through technical feasibility to prototyping and advanced demonstration. It envisages that the TSB would partner government bodies, companies and research organisations and provide up to 50% funding for pre-competitive research and development projects, which could then be matched by sponsoring departments.

THE DUTCH EXPERIENCE

2.21

Uniquely among European countries, in 2004 the Dutch Ministry of Economic Affairs began a pilot of its own version of the US SBIR. The pilot is still ongoing and is being managed by SenterNovem, an agency of the Ministry of Economic Affairs. In 2006 the Ministries of Defence, Agriculture, Fisheries & Foods and Spatial Planning & Water Management joined in the pilot with their own requirements for innovative solutions. A total of six calls for proposals were issued.

2.22

The Dutch SBIR recognises a three-stage process:

- 1 A study into the technical, economic and organisational feasibility of a project idea. The maximum duration of this phase is six months.
- 2 R&D up until a first, non-commercial prototype. The R&D has to conform to the European definition and the maximum duration of a Phase Two project is two years.
- 3 Developing a market-ready product.

2.23

The Government acts as the customer by commissioning projects originally in Phase One, following a call for tenders in response to a defined need. Fixed-price contracts with agreed deliverables are awarded, and companies have to deliver the outputs required whether the budget is sufficient or not. Only

companies that successfully complete a Phase One project are eligible to tender for a Phase Two project. One of the selection criteria for Phase Two is whether the company has found an external party willing to fund or co-fund Phase Three. There is no specific mechanism for the Government to fund Phase Three projects, although it may wish to procure the outputs of a Phase Three project under normal procurement rules.

2.24

Each Dutch SBIR call originally had a budget of 200,000 euros (£138,000) for Phase One projects (designed to cover at least four feasibility studies with a maximum budget of 50,000 euros (£35,000) each) and a budget of 900,000 euros (£620,000) for Phase Two projects (sufficient for at least two R&D projects with a maximum budget of 450,000 euros (£310,000) each). Each Ministry spent most of its budgets, funding four or five Phase One projects, while the Ministry of Spatial Planning & Water Management increased the budgets for its calls because of the high number of proposals that it considered worthy of funding, and funded five and six projects respectively in its two calls.

2.25

SenterNovem consulted the European Commission on the interpretation of the exceptions to the Public Procurement Directives in order to ascertain whether it

would be allowable to restrict the Dutch SBIR to SMEs only. The response received spelt out certain conditions under which this might be acceptable, but it was concluded that it would be too difficult to argue that, such a restriction to SMEs was sufficiently 'imperative in the general interest' and non-discriminatory, and consequently no such restriction was put in place.

2.26

Although no announcement, via the key European mechanisms, was required, the basic EU rules against discrimination still required that applications from companies of any size and from any European country should be accepted and that the calls for tender should be publicised widely on at least a national level. SenterNovem therefore used adverts in trade magazines, press releases to regional and national newspapers, its SBIR website and direct mail. The publicity was not aimed only at SMEs, but in all publicity the programme was described as being aimed particularly at SMEs, and SMEs were explicitly encouraged to respond. In addition, an information meeting was held for each call, and reports of the information meetings were published on the SBIR website.

2.27

In 2007, SenterNovem undertook an evaluation of the pilot while it was still ongoing. All the Ministries involved in the pilots were satisfied with the numbers of tenders

received; on average 16 serious responses per call, primarily from SMEs. The Ministries also reported that the pilot had brought new companies to their attention, that the quality of the proposals was generally high and in some areas very creative proposals were received.

2.28

Across all six calls, 97 proposals were received from 88 different companies. Five companies submitted more than one proposal within the same call, while two submitted proposals in two different calls. 83% of the proposals received came from small companies (<50 employees) and 56% had fewer than 10 employees. Only 9% were not SMEs; none of these ultimately were awarded contracts even though the size of the company was not a selection criterion.

2.29

For each call a judging committee was formed that consisted of representatives from the Ministry involved, the science community, potential further customers, the finance community and business. Proposals were judged on four criteria: contribution to solving the public sector issue; technological quality and innovation; economic prospects; and added value to society and sustainability.

2.30

Although the intention had been to award Phase One contracts within six weeks of the closing date of the relevant call, this was not

always achieved, mainly because of slow internal procedures. However, five of the six calls resulted in decisions within eight weeks.

2.31

28 contracts for phase 1 projects were awarded, half to companies with fewer than 10 employees while most of the remaining contracts went to companies with fewer than 50 employees. None of the companies that won contracts had more than 100 employees.

2.32

40% of the businesses that submitted proposals were less than five years old and 75% less than 15 years old. The age profile of those that won contracts was similar.

2.33

The vast majority (89%) of companies that were awarded an SBIR contract chose to work with other companies (42%), research institutes (18%), or both (29%). 11% did not subcontract any of the work. The programme allows subcontracting up to 33% of the contract value in Phase One and up to 50% in Phase Two.

2.34

At the time of the evaluation, several of the Ministries involved were closely involved with the execution of the feasibility studies, feeding their requirements into the studies and trying to ensure that the outcomes are as relevant

and robust as possible. At the time of writing of this report, the earliest call (for which four Phase One projects had started in 2005) had led to two Phase Two projects that have nearly finished. The remaining Phase One projects (which started in early 2007) are either still ongoing or have just finished. Thus far, approximately 50% of finished Phase One projects have been approved for Phase Two.



THE POTENTIAL FOR A PILOT PROJECT IN NORTHERN IRELAND

3



3.1

Northern Ireland has already had some experience of its own with an initiative that has many of the hallmarks of the pre-commercial procurement of innovation. Under its Broadband Content Initiative, in May 2007, DETI invited creative companies in Northern Ireland to develop new commercial broadband content with a view to purchasing four examples of broadband content that best illustrate the creativity and skills of Northern Ireland companies. These exemplars will be used to promote the Northern Ireland creative sector in external markets.

3.2

The process involved, which is still ongoing at the time of writing of this report, consisted of three steps: an initial selection procedure identified 20 companies that best met the criteria; the development of their business plans, IP rights and Digital Rights Management agreements with financial and advisory support from DETI; and a presentation by all companies to a commissioning panel that selects at least four projects to take forward towards market readiness and ultimate procurement of the four products at a maximum price of 250,000 euros per product. These presentations were held in October 2007 and the initiative is scheduled to be completed by March 2008.

3.3

There are some specific aspects of the

Broadband Content Initiative that allow it to be implemented in relatively short timescales (just over 18 months from start to finish) and with very modest initial budgets (£3,000 plus limited advisory support for the development of the business plan) and the model would need to be adapted for the pre-commercial procurement of other types of products, but at the very least it demonstrates the Northern Ireland government's willingness to experiment with this type of approach.

3.4

In the broad context of Northern Ireland, a number of obvious candidate organisations exist for which the pre-commercial procurement of innovative solutions could well prove valuable, in particular those Government Departments that face challenges that are likely to require innovative science and technology solutions, such as the Department of Health, Social Services and Public Safety, the Department of Agriculture and Rural Development and the Department of the Environment. In addition, there will be requirements across the public sector for solutions to more generic issues such as for example document management or sustainability solutions in areas such as the public sector's own transport requirements.

3.5

The Health and Social Care sector was identified by the Panel as an area of particular

interest, and a number of discussions were therefore held with representatives of organisations active in public procurement, innovation in the Health sector and the bioscience business community. A full list of organisations and individuals consulted is provided in Annex 2.

3.6

These discussions confirmed that public procurement in Northern Ireland has much the same characteristics as it has elsewhere in the UK and Europe, that procurement of innovative science and technology-based solutions is rare and that SMEs often find it difficult to participate in public tenders, although examples were mentioned of SMEs that had been very successful.

3.7

The idea of a pre-commercial procurement pilot was widely supported by the consultees. For a possible pilot in the healthcare field, the consultees identified a number of key organisations and initiatives that could be involved, including the Central Services Agency (the Centre for Procurement Expertise for health supplies and services), HSC Innovations (the innovation management and IP exploitation centre for the Health Service), Biobusiness Northern Ireland (the business association for the Life and Health Technology sector), the MATRIX Life & Health Sciences Horizon Panel and the HSC Research Office, which funds healthcare research.



CONCLUSIONS AND RECOMMENDATIONS





GENERAL CONCLUSIONS

4.1

Government procurement can best stimulate economic return from the commercial exploitation of the local research, science and technology (S&T) base by implementing a precommercial procurement scheme that provides a mechanism to de-risk innovative ideas and make them more 'procurement-ready', instead of trying to make substantial changes to mainstream procurement practices.

4.2

Such a scheme has to be aligned closely with mainstream procurement needs and mechanisms, as well as with the relevant innovative business and knowledge communities, in order to ensure that there is a clear path from the development of innovative solutions to subsequent mainstream procurement steps.

4.3

At the same time, mainstream procurement practices should be adapted to make them more 'innovation-friendly' as far as is practicable, using the guidelines issued by the Office of Government Commerce, since this will increase the likelihood that solutions developed using pre-commercial procurement can subsequently be adopted through mainstream procurement.

4.4

In order to manage the technological and financial risk and fit into the most favourable EU regulations, it is helpful to recognise three distinct stages in the pre-commercial procurement process, namely feasibility studies; R&D up to a first non-commercial prototype; and development of a market-ready product, with each stage having its own budgets and targets.

4.5

Pre-commercial procurement of feasibility studies and R&D up to a pre-commercial prototype can be classified as procurement of R&D services and therefore be exempt from State Aid restrictions and from the strict requirements for Europe-wide tendering, as long as the benefits of the R&D are not completely for the contracting authority (which can be achieved by allowing third-party exploitation) or the R&D is not fully paid by the contracting authority.

4.6

Nevertheless, any pre-commercial procurement needs to conform to WTO and EU competition and anti-discrimination rules and therefore cannot be restricted to certain classes of companies (such as SMEs) or to companies from a certain geographical area (such as Northern Ireland). Any calls for tender have to be published in such a way to enable real competition to occur. In practice however, it

has been demonstrated that it is possible to achieve high participation by small innovative companies from a single country, by tailoring the publicity and tender specifications appropriately.

4.7

The development of the first prototype into a market-ready product cannot be funded through the procurement of R&D services as defined in the EU Procurement Directives and is therefore subject to the normal WTO and EU procurement regulations. It would need to be announced Europe-wide and be subject to full competition, and it is more likely that at this stage a higher proportion of larger companies would be involved. However, it also becomes more likely that private sector parties will be prepared to fund the further development of prototype solutions generated under earlier pre-commercial procurement stages. By encouraging the identification of such sources of finance during the earlier pre-commercial procurement stages, the chance that a market-ready solution ultimately becomes available even without government finance can be maximised.

RECOMMENDATIONS FOR A PILOT PROJECT IN NORTHERN IRELAND

4.8

In Northern Ireland, a pilot could be undertaken in various sectors with various Government Departments, with the Health & Social Care sector a promising first candidate. A key first step would be to identify a budget, the size of which would depend on the characteristics of the proposed solutions, which in turn depends on the functional specification. Therefore, only indicative budgetary amounts can be provided here. An indicative minimum budget for a pilot would be £750,000 plus management costs (5-10% of the project budget), to cover at least four Phase One projects with an indicative budget of £35,000 each and at least two Phase Two projects with an indicative budget of £300,000 each. It may be desirable to budget for more Phase One projects in order to have a wider 'pool' of prospective solutions to choose from.

4.9

There is a strong argument that the customer (i.e. the organisation that ultimately wishes to procure and use the solution - in a healthcare pilot probably the Department of Health, Social Services and Public Safety (DHSSPS)) should provide the budget, in order to ensure a sense of 'ownership' and commitment to achieving the right outputs and outcomes, and to create the conditions for a clear contractual relationship between the supplier and the customer. If it is not feasible for the customer in a pilot to provide the budget, then if a

budget is found elsewhere it should ideally be transferred to the customer at the start of the process.

4.10

Another key practical issue is the question of who manages the pre-commercial procurement process. This task will require a good understanding of procurement practices and regulations, but because of the distinct character of pre-commercial procurement compared to mainstream procurement it is probably not appropriate for a mainstream procurement body (the Central Services Agency in the case of a healthcare pilot) to undertake it. Instead, existing procurement expertise should probably be provided through the establishment of a steering group that brings together the customer with the management body and relevant mainstream procurement organisation(s).

4.11

In the healthcare sector an intermediate body such as HSC Innovations could in principle be considered for the management, but if the first pilot is successful there will be further precommercial procurement involving other Government Departments, which means that there would be benefits in using a more generic intermediate body. In the Dutch exemplar, the SBIR processes are managed on behalf of the Ministries involved by SenterNovem, which is an agency of the Ministry of Economic

Affairs charged with promoting innovation and sustainable development through the management of support programmes for various Ministries as well as the European Commission, the International Energy Agency and foreign governments. An approximate equivalent in Northern Ireland would be Invest Northern Ireland, and consideration should therefore be given to involving Invest Northern Ireland in the pilot.

4.12

In order to determine the scope of the pilot, the recommended approach would be to arrange an 'early engagement' discussion between the customer and prospective providers of ideas and solutions. Although the ultimate intention is that the suppliers will be small and medium-sized businesses, at this stage it is probably desirable that the discussion includes relevant university groups, research centres and prospective sources of ideas from within the customer organisation. In the context of a healthcare pilot, these discussion partners would include Biobusiness Northern Ireland and selected SMEs from the (sub-)sectors in which solutions may be found, the DHSSPS (potentially including clinicians with ideas for possible solutions), the MATRIX Life & Health Sciences Horizon Panel as well as research groups in the relevant subject area.

4.13

Such early engagement would not only inform

key elements of the process such as the required budget and the functional specification of the solicitations, but also provide insights into potential collaborations between SMEs and other parties that have relevant ideas, capabilities to develop them and/or access to further markets.

4.14

In this context, even large companies may form a useful part of the solution and consideration should be given to involving them at an appropriate stage in the process. As discussed above, the recommended model for the European-style SBIR relies on third-party financing during Phase Three and the Dutch experience has shown that frequently it is large companies with an interest in the outputs of the development process that take an interest in the (part-)financing of Phase Three projects.

4.15

Clarity will need to be provided on Intellectual Property issues. By default, ownership of the IP rights should rest with the supplier, with the customer receiving exploitation rights. Any agreements with third parties such as large companies that express an interest in commercialisation will need to be negotiated between the supplier and the large company. It is of course possible that a large company will buy the IP rights or even buy the small company, in its entirety, and that the ultimate supplier of the innovative product will then be

the large company. Consideration should be given to this possibility and whether action should be taken to try to discourage or prevent it. The Dutch experience may be of limited value in this regard because the Netherlands has more of a history of consensus agreements between the public and private sector than the UK does.

4.16

Another issue to consider at this stage is that of the timescales involved and the implications for expanding the pilot into a mainstream scheme. The process of preparing for the solicitation, publicising it, accepting and assessing submissions and signing contracts is likely to take around six months. Phase One projects would typically take six months to complete and subsequent Phase Two projects two years, with at least three months between the end of the Phase One projects and the start of Phase Two. After this, in most cases the prototyped solutions will have to go through a Phase Three development before the end product(s) can be offered for mainstream procurement, which could take another two years or so. This means that it is likely that mainstream procurement won't take place until perhaps five years after the start of the pilot. Not only does this mean that there has to be commitment from the parties involved over that timescale, but that consideration needs to be given to the timescales on whether any further pilots or a wider roll-out should start before the

initial pilot has run its complete course.

4.17

Finally, to increase the likelihood of success it is advisable to try to establish an ongoing dialogue with SenterNovem, which is the only organisation in Europe with detailed hands-on experience of an SBIR pilot and which can no doubt provide much valuable further information and insights.



ANNEX A



REFERENCES

THE FOLLOWING DOCUMENTS AND WEBSITES WERE CONSULTED IN THE DESK RESEARCH:

- 1 'Secrets' of the world's largest seed capital fund: How the United States Government uses its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to support Small Technology Firms, David Connell, Centre for Business Research, University of Cambridge, 2006
- 2 Exploiting the UK's Science and Technology Base: How to fill the gaping hole in UK Government policy, David Connell, December 2004
- 3 Finding and Procuring Innovative Solutions - Evidence-based practical approaches, Office of Government Commerce/ Department for Innovation, Universities & Skills, 2007
- 4 Capturing Innovation - Nurturing suppliers' ideas in the public sector, Office of Government Commerce, 2004
- 5 Early Market Engagement - Principles and Examples of Good Practice, Office of Government Commerce/Centres of Excellence, 2006
- 6 Competitive Dialogue Procedure - OGC Guidance on the Competitive Dialogue Procedure in the new Procurement Regulations, Office of Government Commerce, January 2006
- 7 Smaller supplier... better value? The value for money that small firms can offer. Office of Government Commerce/Small Business Service, 2005
- 8 The Race to the Top - A Review of Government's Science and Innovation Policies, Lord Sainsbury of Turville, October 2007
- 9 Transforming Government Procurement, HM Treasury, January 2007
- 10 Public Procurement Policy, Department of Finance and Personnel, Northern Ireland, May 2002
- 11 The Northern Ireland Economic Bulletin 2007, section three Innovation, Department of Enterprise, Trade and Investment, 2007
- 12 Creating an Innovative Europe - Report of the Independent Expert Group on R&D and Innovation appointed following the Hampton Court Summit and chaired by Mr Esko Aho, January 2006.
- 13 The access of SMEs to public procurement contracts, EIM Business and Policy Research/ KMU Forschung Austria on behalf of the European Commission, March 2004
- 14 Innovation and Public Procurement - Review of Issues at Stake, Fraunhofer Institute Systems and Innovation Research on behalf of the European Commission, December 2005
- 15 Opportunities for Public Technology Procurement in the ICT-related sectors in Europe, Rambøll Management on behalf of the European Commission DG Information Society and Media, October 2007²
- 16 Pre-commercial procurement of Innovation - A missing link in the European Innovation cycle, National IST Directors' Forum Working Group on Public Procurement in support of Research and Innovation in ICT, March 2006
- 17 Community Framework for State Aid for Research and Development and Innovation, Official Journal of the European Union 2006/C 323/01, 30th December 2006
- 18 Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.
- 19 Innovation and public procurement - A new approach to stimulating innovation. CBI/QinetiQ, October 2006
- 20 Eerste evaluatie SBIR pilots (First evaluation SBIR pilots), SenterNovem, June 2007 (in Dutch)
- 21 Achtergrondnotitie SBIR voor juridisch overleg (background note on SBIR for legal consultation), Netherlands Ministry of Economic Affairs, March 2006 (in Dutch)
- 22 Communication from the European Commission DG Internal Market & Services on whether R&D contracts can be reserved for SMEs, 2006, provided by SenterNovem
- 23 Private communications with Mrs Carla Dekker, SBIR Pilot Manager, SenterNovem
- 24 Websites:
US Small Business Administration - SBIR and STTR: www.sba.gov/SBIR/indexsbir-sttr.html
US Department of Health & Human Services - SBIR and STTR: http://grants.nih.gov/grants/funding/sbirsttr_programs.htm
Department for Business Enterprise & Regulatory Reform - SBRI: www.berr.gov.uk/innovation/sbri/index.html
Department for Business Enterprise & Regulatory Reform - Public Procurement Policy: www.berr.gov.uk/innovation/public_procurement_policy/index.html
European Public Procurement Network: www.publicprocurementnetwork.org/index.htm

2. This was an unpublished advanced draft provided on the understanding that no specific references to the content would be made.



ANNEX B

B



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