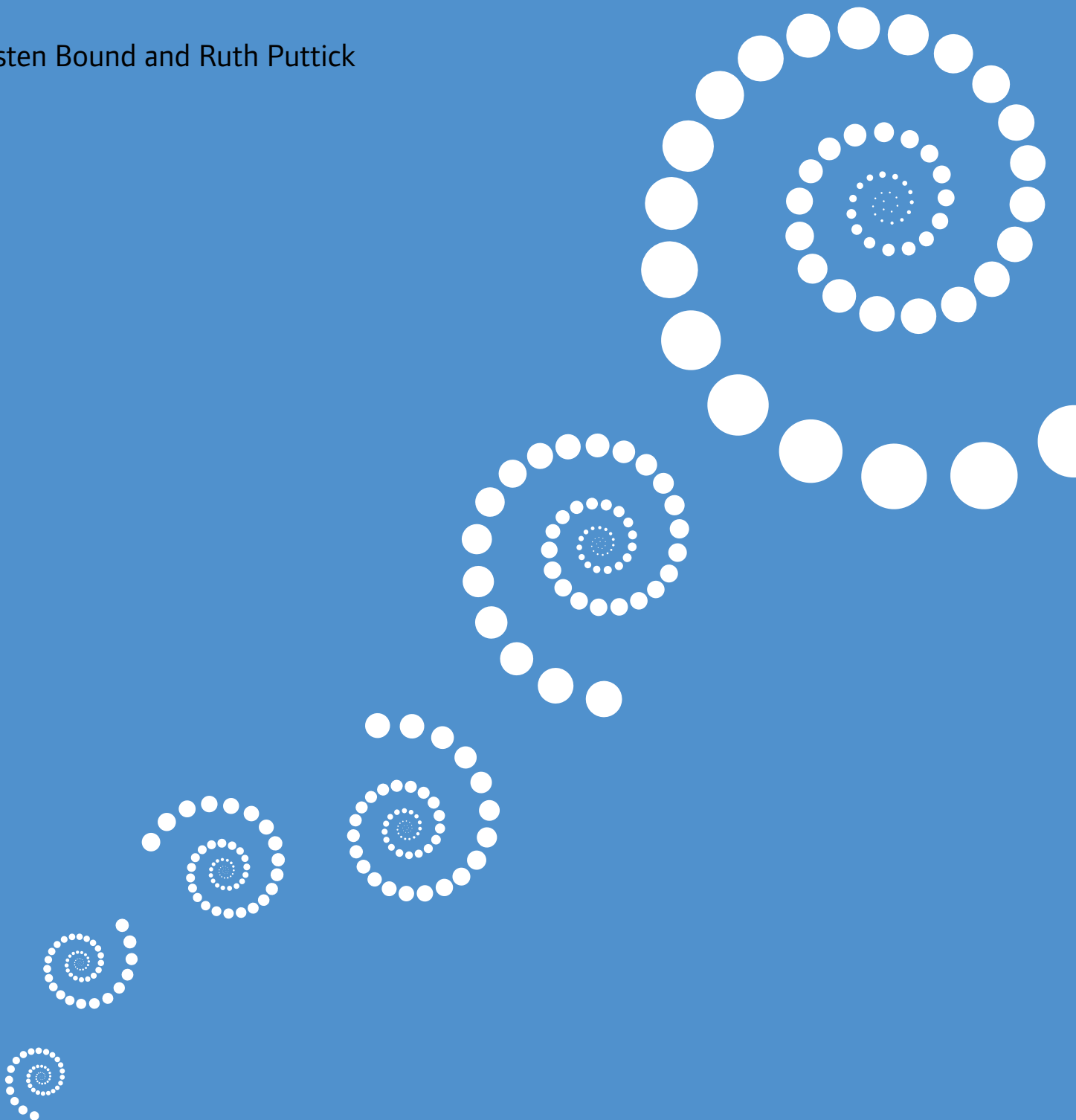


# Buying Power?

Is the Small Business Research Initiative for  
procuring R&D driving innovation in the UK?

Kirsten Bound and Ruth Puttick



# Contents

## Buying Power?

Is the Small Business Research Initiative for procuring R&D driving innovation in the UK?

<b>Part 1: Introduction</b>	<b>3</b>
<hr/>	
<b>Part 2: Background context – the origins and growth of the SBRI</b>	<b>5</b>
2.1    What is the SBRI?	5
2.2    The United States SBIR as a model of success	5
2.3    Origin and growth of the UK SBRI	7
<hr/>	
<b>Part 3: Analysing the evidence - is the SBRI on track to deliver?</b>	<b>9</b>
3.1    Solutions on tap? Public sector experiences of SBRI	12
3.2    An SBRI sunrise? Benefits of SBRI for small businesses	15
3.3    A new lease of life for the SBRI? Challenges ahead	16
<hr/>	
<b>Part 4: Conclusion and recommendations</b>	<b>18</b>
a.    Scaling up the SBRI scheme	18
b.    Quality control for SBRI	19
c.    Boosting demand for innovation	20

NESTA is the National Endowment for Science, Technology and the Arts.

Our aim is to transform the UK's capacity for innovation. We invest in early-stage companies, inform innovation policy and encourage a culture that helps innovation to flourish.

## Part 1: Introduction

1. European Union (2006) 'Pre-commercial procurement: A missing link in the EU innovation cycle.' Brussels: European Union.
2. OGC (2010) 'Policy Through Procurement Action Plan.' Norwich: OGC. Available at: [http://www.ogc.gov.uk/documents/PtP\\_Action\\_Plan.pdf](http://www.ogc.gov.uk/documents/PtP_Action_Plan.pdf)
3. BIS (2009) 'SET Statistics: Science, engineering and technology indicators.' London: BIS. Available at: <http://www.dius.gov.uk/policies/science/science-funding/set-stats>
4. European Commission (2008) 'Pre-commercial procurement: Driving innovation to ensure high quality public services in Europe.' Luxembourg: Office for Official Publications of the European Communities. Calculated using OJEU and FPDS.
5. Evans, P. and Khan, M. (2009) The Characteristics of Patents. 'Economic & Labour Market Review.' Vol 3, 12.
6. See <http://stats.bis.gov.uk/ed/sme/sme-stats2008-ukspr.pdf>
7. Four-fifths of high-growth firms employ fewer than 50 employees. Young firms are more likely to be high-growth, even if most high-growth firms are old. For more analysis of the characteristics of high growth businesses see NESTA (2009) 'The vital 6 per cent: How high-growth innovative businesses generate prosperity and jobs.' London; NESTA; and Anyadike-Danes et al. (2009) 'Measuring Business Growth: High growth firms and their contribution to employment in the UK.' London: NESTA.
8. Broadcast on the BBC, 'Dragons' Den' is a popular TV show that features entrepreneurs pitching their ideas to five multi-millionaire 'Dragon' venture capitalists.
9. Connell, D. (2010) 'Exploding the Myths of UK Innovation Policy: how soft companies and R&D contracts for customers drive the growth of the hi-tech economy.' Cambridge: CBR.
10. See Connell, D. (2004) 'Exploiting the UK's Science and Technology Base: How to fill the gaping hole in UK government policy.' Cambridge: TTP Ventures; and Lord Sainsbury of Turville (2007) 'The Race to the Top: A Review of Government's Science and Innovation Policies.' London: TSO.

Public procurement of technology has been the basis of some of the most transformational global innovations of recent decades. It has given us the GPS navigational systems now ubiquitous in our cars and the Internet Protocol (IP) technology that allows us to send data between computers. At the same time, public procurement of products and services represents between 15 per cent and 20 per cent of GDP for most European Countries.<sup>1</sup> It is worth around £220 billion a year in the UK alone.<sup>2</sup> While only a small proportion of this sum is spent on research and development (R&D) – the Government spent £2.5 billion on R&D in private industry and public corporations in 2005/6<sup>3</sup> – it still represents a powerful lever for innovation. Yet it is a lever that is under-exploited across Europe. While American public procurement markets are no greater than those in Europe, the USA spends around twenty times more than the European Union each year on procuring R&D.<sup>4</sup>

This gap hasn't gone unnoticed. At a time when the UK government is acutely aware of the need to drive economic growth whilst cutting public spending, it has sought ways to make better use of this buying power to drive innovation. Yet many previous policies and programmes have failed to bring about the desired results. Not only has it proven exceedingly difficult for small businesses to win government R&D contracts, government departments have also been unwilling to accept the risk of financing risky early-stage technology development.

Small businesses are a critical source of innovation, so it is vitally important to the economy that we help them grow.<sup>5</sup> They are far from being a marginal group – 99 per cent of firms in the UK employ fewer than 50 people,

and between them they employ more than 11 million and have a turnover of over £1,000 billion.<sup>6</sup> These include high-tech firms with high growth prospects, those that we are relying on to drive economic growth.<sup>7</sup> Unfortunately too many of these will remain small, failing to attract the 'break' that enables them to scale up their commercial activity. Contrary to popular belief, the fate of these high tech companies is not solely determined in the Dragons' Den.<sup>8</sup> Venture capital may fund the sparky spin-outs and later-stage endeavours, but commercial research and development contracts are more likely to make a tech business viable, and attract finance to grow its innovative activities.<sup>9</sup>

This is why the Small Business Research Initiative (SBRI) was established in the UK in 2001. It was modelled on a highly successful United States programme established during the Reagan administration. Designed as a tool to open up public sector procurement of pre-commercial R&D to a wider audience of small businesses, it features a standardised process that helps manage the risks of innovation on both sides.

Yet the original UK scheme was a pale imitation of the US SBIR. The scheme was hampered by limited public sector take up, and where SME contracts were awarded, researchers found that less than 1 per cent of them were for research and development. After successive calls for, and attempts at reform, a renewed UK SBRI was launched in April 2009 after a pilot in late 2008.<sup>10</sup> The new SBRI finally resembles the American SBIR with a clear model process to help public sector bodies work with innovative SMEs and a strong focus on technological R&D.

With public finance sparse and R&D spending under pressure, it is timely to assess whether the newly reformed SBRI is on track to deliver the desired innovation benefits. The SBRI espouses a unique triple offer of helping government find urgent innovative solutions to public sector challenges, accelerating technology development in the private sector, and driving economic growth. That is why despite its relative novelty – new competitions are not due to deliver final products for at least another year – NESTA has undertaken this analysis of the new SBRI. A ‘health-check’ rather than an impact assessment, this report looks at a carefully chosen sample of new SBRI competitions to analyse the effects of SBRI on both the companies and public sector bodies engaged in the scheme.

Our research shows that the vital signs of the SBRI are good. Ten years after its original introduction in the UK, the reformed version of the Initiative seems to have finally found its feet. Thirteen public sector bodies are engaged, 28 competitions are underway, with 425 confirmed contracts amounting to a combined value of £27 million. For companies interviewed, it is filling a funding gap for innovation. Specific and appropriately sized R&D contracts combined with a need to solve live public challenges are accelerating technology development. On the public sector side, departments and agencies are learning how to communicate their needs more effectively to the private sector, with genuinely interesting solutions going to market that would not have been reached by other means.

These are still early days for the SBRI, with many outstanding issues both for government and the Technology Strategy Board, which manages and champions the SBRI in this new phase. These issues include how to increase public sector take-up of the scheme without compromising the quality of what the SBRI offers to SMEs, and how departments can use the SBRI to help them transform their wider approach to leveraging innovation with procurement. Incentivising participation by public bodies is likely to be challenging in the short term, particularly without a match-funding facility. Our research suggests that the SBRI will be most effective as part of a comprehensive framework for leveraging demand for innovation to pull new technology to market. An open data policy that enables rigorous analysis of economic impact is critical, in combination with user networks that help support the major culture shift required in the public sector.

Scaling up the SBRI is not necessarily about ‘new’ R&D money, but ensuring that more existing public resources for R&D are spent with small businesses in a way that is likely to maximise the impact of the investment. This said, scaling up the SBRI scheme is not easy, and could require new means to incentivise participation of public sector departments and agencies in the short term, particularly given its potential economic impact.

While departments are under ever more pressure for cost effective procurement, government should ensure that the push for austerity does not allow us to lose momentum on achievements so far in using procurement to drive innovation.

In this report, we outline the origins and unique facets of the SBRI in Chapter Two. Then, we analyse seven of the most advanced competitions in detail in Chapter Three from the perspective of public sector bodies and small businesses. In Chapter Four, we conclude with a set of recommendations on how to build on the early successes of the reformed SBRI.

## Part 2: Background context – the origins and growth of the SBRI

The UK SBRI scheme is modelled on the successful American Small Business Innovation Research (SBIR) programme, operational in the US since the Reagan Administration. In this chapter, we explain the SBIR concept and describe the economic impacts of the US scheme. We clarify how the UK SBRI works; explaining what sets it apart from other R&D funding mechanisms, and how it differs from the United States SBIR. This Chapter also outlines the history of the SBRI in the UK to date, setting the scene to analyse achievements since April 2009 in Chapter Three.

### 2.1 What is the SBRI?

The SBRI is a model process designed to help public sector bodies to procure R&D from small businesses. The process has four broad stages. In the first stage, government departments or public sector organisations identify a serious operational or policy problem and work out the clearest way to communicate their need or problem to businesses. In the second stage, there is an open competition, where those companies with promising solutions are awarded R&D contracts to test the feasibility of their solutions (Phase 1 funding). In the third stage, those companies that successfully pass the feasibility test can apply for further contracts to develop a working prototype (Phase 2 funding). In the final stage, the public sector either procures the resultant technology or it enters the open market (or both).

To use examples that follow later in this report, the Ministry of Defence might be looking for technology that could reduce the weight of equipment carried by its soldiers or the NHS might want to find technology that

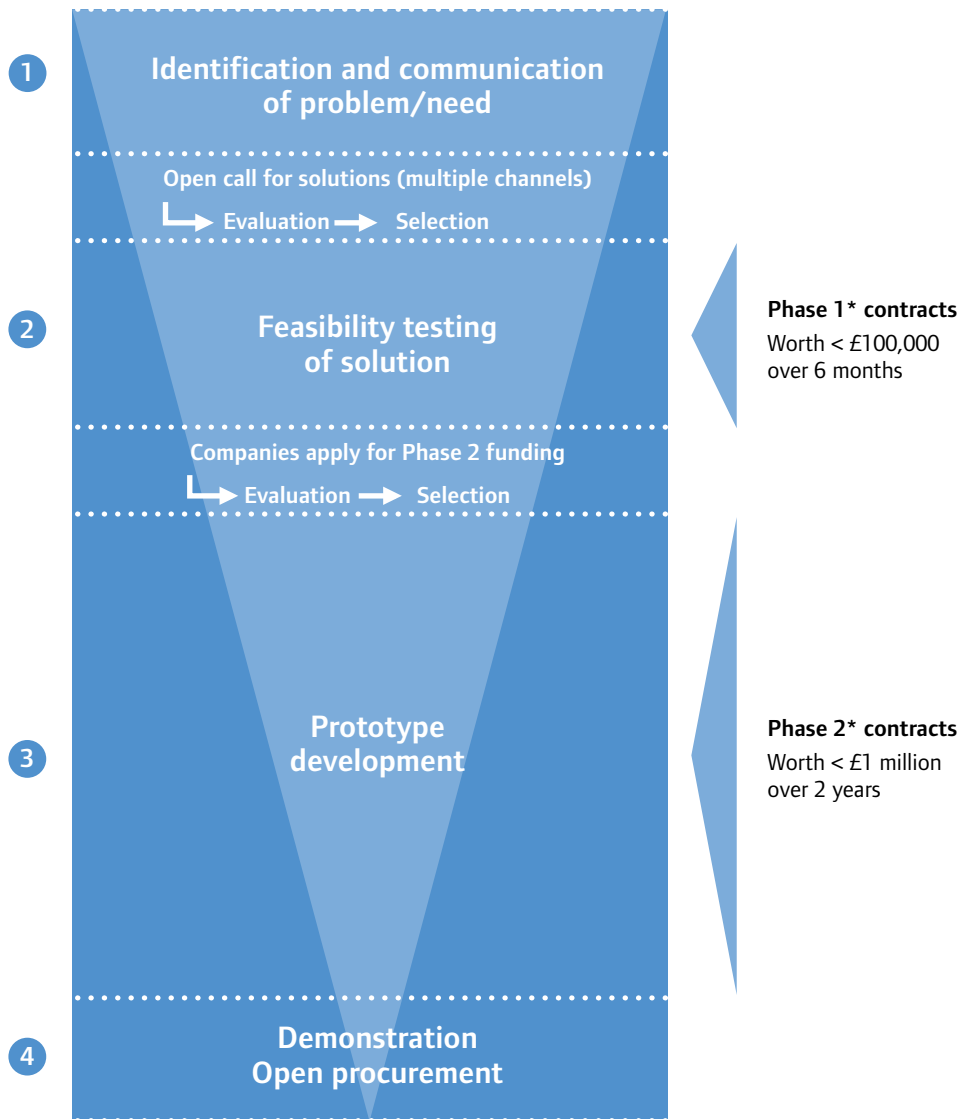
could reduce the risk to patients of hospital-acquired infections. Where small businesses have technologies that could provide potential solutions, the SBRI provides an accelerated route to market for their ideas. Unlike many R&D projects which offer grant or match-funding, SBRI provides 100 per cent funded development contracts where government is the customer. Phase 1 contracts for feasibility testing are valued at up to £100,000 and last for six months. Phase 2 contracts for prototype development are worth up to £1 million over two years. While the public sector has the right to license the resultant technology, its intellectual property (IP) remains with the company. Whether the public sector procures the technology or not, the firm is in a position to commercialise the technology on the open market.

### 2.2 The United States SBIR as a model of success

Threatened by the rapid economic rise of Japan and concerned that the US was failing to translate research excellence into commercial advantage, the US government introduced the SBIR in 1982. Designed to support small businesses in developing new technology that helped achieve government missions, it involved a mandate for all federal departments with R&D budgets of over \$100 million (£69 million) to spend 2.5 per cent of their R&D budget with small businesses.

Despite limited formal evaluations of economic impact, there are some major success stories of companies funded by SBIR, which now issues contracts worth \$2 billion annually. One early beneficiary, Qualcomm, is now a telecoms giant

**Figure 1: How the SBRI works**



\*Competition may be single phase

11. Lerner, J. (1999) Public Venture Capital: Rationale and Evaluation. In: Wessner, C. (Ed.) (1999) 'The Small Business Innovation Research Program: Challenges and Opportunities.' Board on Science, Technology and Economic Policy. National Research Council. Washington, DC: National Academy Press.
12. Lerner, J. (1999) Public Venture Capital: Rationale and Evaluation. In: Wessner, C. (Ed.) (1999) 'The Small Business Innovation Research Program: Challenges and Opportunities.' Board on Science, Technology and Economic Policy. National Research Council. Washington, DC: National Academy Press.
13. Dow Jones Venturesource data accessed April 2010 (Industry Segment: Communications & Networks, Electronics & Computers, Information Services, Software, Semiconductors, Other IT).

with over 9,000 employees and annual revenue of \$6.6 billion, while biotechnology firm Amgen has grown to 14,000 employees and annual revenue of \$12 billion. Surveys have found that the SBIR was 'make or break' for many of the technologies; 66 per cent of SBIR projects would never have taken place without SBIR funding and 20 per cent of contract winning companies were founded at least partly as a result of an SBIR award. One quarter of SBIR projects receive at least one patent.<sup>11</sup>

Perhaps even more striking is the effect of SBIR on company growth. One academic study found that over ten years, SBIR-funded

companies generated five times more growth than other companies.<sup>12</sup>

Contract R&D funding is an important avenue for growing technology businesses. When we think about ways of exploiting the UK science and technology base for innovation it is easy to focus on the Silicon Valley model of venture capital-funded growth. Yet this is only viable for a small proportion of technology companies, and when access to finance is tight, such funding becomes even more limited: while 205 technology companies raised venture capital in 2005, only 80 did so in 2009.<sup>13</sup> More common are 'soft start ups' – when technology

companies establish themselves through consultancy contracts for clients requiring help with specific problems. This contract model can lead to growth by itself, or it can result in demonstrators and prototypes that will create a far more appealing investment prospect for a venture capitalist.<sup>14</sup>

### 2.3 Origin and growth of the UK SBRI

The UK SBRI got off to a very slow start after its 2001 launch. Of the few departments that did adopt the SBRI, most contracts were for policy studies or research grants, rather than technology development. A campaign for renewal in December 2004 resulted in a mandatory departmental SBRI spending target of 2.5 per cent of external R&D.<sup>15</sup> This could have allocated £100 million per annum for the scheme, yet the metric generated frustration in departments and damaged its reputation as it was considered a 'small business tax'.<sup>16</sup> Only 1 in 200 contracts placed before 2008 met the Treasury's definition of R&D, with opportunities advertised ranging from the supply of Chinese library books to lawnmower maintenance services.<sup>17</sup> The SBRI was no more than a small business spending metric.

In 2008, Lord Sainsbury's *Race to the Top* called for a far closer alignment of the SBRI with the US model.<sup>18</sup> It fell to the Technology Strategy Board (TSB), a non-departmental public body, to implement Sainsbury's vision, acting as a champion and steward of the scheme. The TSB developed a new model process for the SBRI and began advertising contract competitions in April 2009 following a late 2008 pilot.

The SBRI has some shared features with other means of funding R&D. Like challenge funds, the scheme sets out to find solutions to specific problems, funding results not activity. A high proportion of R&D funding in the UK is in the form of collaborative R&D grants that often come with constraints such as a requirement to build partnerships. SBRI funding has fewer constraints. A contract is awarded to a single company, although interdisciplinary partnerships frequently develop as companies join forces through sub-contracting to respond to a challenge. Since the focus is on near to market solutions, the results are likely to be available far more quickly than collaborative R&D programmes.

SBRI is designed to benefit both the public sector and the recipient companies, having

a significant effect on the wider economy. It enables the public sector to:

- Use innovation and technology to deliver step function improvements in operational performance or in progress towards policy objectives.
- Rapidly access companies, new ideas and technologies that would not be reached through normal channels.
- Encourage innovation by defining and broadcasting challenges and desired outcomes and then procuring and supporting the R&D effort of contract winners.

It supports innovative businesses by providing:

- An intelligent lead customer to help validate and refine an idea and provide a route towards market for new ideas and technologies.
- 100 per cent funded R&D contracts to develop the idea.
- Credibility for follow-on investment from private sector, assuming rigorous public sector due diligence and clear market potential.
- A simple means of engaging with the public sector and a link into mainstream public procurement.

Following the latest reform, the UK SBRI is finally starting to resemble the US SBIR. Yet with the SBIR almost 30 years old and subject to a different regulatory regime, it is too early to determine if the impact of the UK scheme will match that of its American inspiration. Table 1 compares the UK and US schemes.

During 2009 there were 789 'topics' addressed by the US SBIR, attracting roughly 12,000 proposals, with 2,000 Phase I contracts awarded. With a streamlined application process, chances of receiving funding are very high compared to many other innovation funding mechanisms. In the US, SBIR applicants have a 15-18 per cent chance of winning a Phase 1 contract, while phase 1 winners who apply to Phase 2 have a 50 per cent to 60 per cent chance of winning a contract. Although currently run on a much smaller scale, UK applicant companies can expect similar success rates – there is currently a 16 per cent chance of winning a Phase

14. Connell, D. (2010) 'Exploding the Myths of UK Innovation Policy: How 'soft companies' and R&D drive the growth of the hi-tech economy.' Cambridge: Centre for Business Research.

15. Connell, D. (2006) 'Secrets of the World's Largest Seed Capital Fund Centre for Business Research.' Centre for Business Research, University of Cambridge. Cambridge: University of Cambridge.

16. See Budget 2005. Available online at: [http://www.hm-treasury.gov.uk/d/bud05\\_complereport\\_147.pdf](http://www.hm-treasury.gov.uk/d/bud05_complereport_147.pdf); and DIUS (2008) 'Innovation Nation.' London: DIUS.

17. Connell, D. (2007) From the presentation 'How to make SBRI work effectively.'

18. See Budget 2008. Available online at: [http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/media/9/9/bud08\\_complereport.pdf](http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/media/9/9/bud08_complereport.pdf). pp.55.

**Table 1:** Comparing the US SBIR and the UK SBRI

	UK SBRI	US SBIR
<b>Date established</b>	2001 (Re-launched in 2009 with pilots from 2008)	1982
<b>Coordination</b>	Technology Strategy Board	Small Business Administration
<b>Mandated?</b>	No, discretionary take-up by public sector bodies	Yes, 2.5 per cent of Federal R&D budgets over \$100m
<b>Eligible organisations</b>	EU companies of all sizes (SBRI is exempt from advertising contracts in OJEU)	Small businesses (< 500 employees) at least 50 per cent owned by an American citizen
<b>Value of contracts awarded per year</b>	370 contracts worth £24.5m (April 2009 – December 2009)	4,000 contracts a year average, worth \$2 billion (£1.4 billion) <sup>19</sup>
<b>Phase 1</b>	Feasibility testing for up to 6 months. Contracts < £100,000	Feasibility testing for up to 6 months. Contracts < \$150,000 (£104,000)
<b>Phase 2</b>	Development of prototype or demonstrator for up to two years Contracts < £1 million (but subject to unique needs of competition)	Development of prototype or demonstrator for up to two years Contracts typically < \$1 million (£694,000) <sup>20</sup>
<b>Phase 3</b>	No Phase 3	No additional SBIR funds but follow through from sponsoring government department – with support for technology development, and potentially additional (non-SBIR) funding <sup>21</sup>

1 contract and, if successful, a 46 per cent chance of winning a Phase 2 contract.<sup>22</sup>

**Is there a hole in UK innovation policy? How do we compare globally?**

We highlighted in the introduction the size of the missed opportunity to use procurement to drive innovation. Experts criticised this ‘gaping hole’ in government innovation policy, in 2004.<sup>23</sup> Today policy is catching up, with a strong emphasis on policies that leverage demand for innovation.<sup>24</sup> Yet there remain significant gaps in practice. While the US is a common benchmark for practice in pre-commercial procurement, several Asian countries are also exploiting such opportunities. With strong, central coordination for science and technology, China and Korea have embraced related policy tools, while Japan has used public R&D procurements significantly to reduce the cost of fuel cell stations, making fuel cell-powered buses a viable energy efficient public transport option.<sup>25</sup> While the UK has stagnated around 40<sup>th</sup> position in global rankings of government procurement of advanced technology, Singapore and Taiwan

have joined Finland and Denmark in the top ten.<sup>26</sup>

Nevertheless, after a false start, the UK SBRI now resembles the US SBIR programme in methodology, if not yet in scale. In the next chapter we look in more detail at the roll out of the UK SBRI since April 2009 to see if it is yet on track to deliver the expected benefits for the public sector, business and the economy.

19. Connell, D. (2006) ‘Secrets of the World’s Largest Seed Capital Fund. Centre for Business Research, University of Cambridge. Cambridge: University of Cambridge.
20. For a fuller explanation of the increased funding threshold see the ‘Notice of final amendments to Policy Directive in the Federal Register: March 30, 2010.’ (Volume 75, Number 60) [Page 15756-15757]. Available from the Federal Register Online at: <http://edocket.access.gpo.gov/2010/2010-7018.htm>
21. For more information, see: <http://www.sbir.net/content/52/sbir-phase-iii.php>
22. Personal communications with the US SBA and UK TSB, 21st April 2010.
23. Connell, D. (2004) ‘Exploiting the UK’s Science and Technology Base: How to fill the gaping hole in UK Government Policy.’ Cambridge: TTP Ventures.
24. See for example Department of Business, Universities and Skills Innovation Nation White paper from 13th March 2008. Available at <http://www.bis.gov.uk/policies/innovation/white-paper>
25. European Commission (2008) ‘Pre-commercial procurement: Driving innovation to ensure high quality public services in Europe.’ Luxembourg: Office for Official Publications of the European Communities.
26. World Economic Forum (2009) ‘Global Competitiveness Report 2009-2010.’ Geneva: World Economic Forum. Available online at: <http://www.weforum.org/documents/GCR09/index.html>

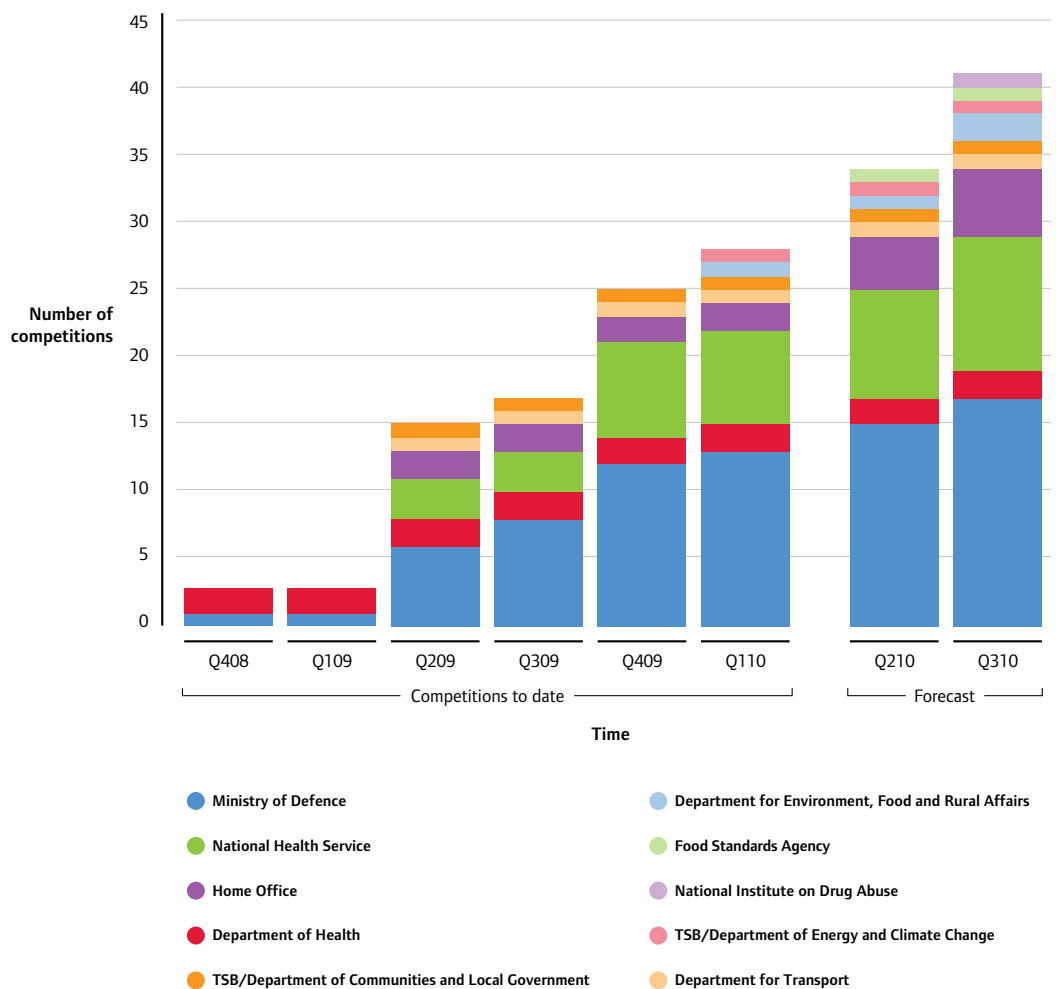


## Part 3: Analysing the evidence – is the SBRI on track to deliver?

So, does the 2009 reform really represent a new lease of life for SBRI? With early competitions not due to complete for another year, it is too early for formal evaluations. Yet the need for growth through innovation is urgent enough to demand a preliminary

assessment. In this chapter, we look closely at a number of competitions to analyse if the new version SBRI is on track to deliver the desired benefits. After outlining the trend in SBRI roll out, we highlight some early indications of success. We look in turn at public and

**Figure 2:** Competitions launched April 2009 – January 2010 and forecasted



**Note:** Forecast correct as at March 2010.  
**Source:** TSB.

private sector experiences of the SBRI before highlighting challenges that must be addressed to avoid the scheme stalling or its potential impact being reduced.

### Progress to date

Despite its infancy, the new SBRI has already vastly outpaced the 2001 version. Including the 2008 pilots, 28 competitions are underway involving 13 government departments and agencies. Over a thousand applications have been submitted by companies, many of which had never supplied the public sector before. 425 contracts have so far been awarded, with

a total value of over £27 million. It is important to note that the figures are skewed somewhat by the 'Retrofit for the Future' competition, part of a wider TSB programme. This was anomalous in that 193 smaller £20k Phase 1 contracts were awarded in addition to 87 Phase 2 contracts with a total value of £4.8 million. This is included in our selection of case studies for comparison.

Figure 2 on page 10 shows the growth of the SBRI in the UK and the distribution of public sector bodies engaged.

**Table 2:** Case study competitions analysed

Case study competition	Competition Aims	Lead Department	Applicants for P1	Phase 1	Phase 2
<b>Pathogen detection in the hospital environment</b>	To speed up the development and adoption of technologies to further combat Healthcare Associated Infections (HCAI).	<b>Department of Health</b>	53	13 contracts Total £1.2m	3 contracts awarded and 1 pending  Value pending
<b>Hand hygiene</b>	To develop technologies and systems to improve hand hygiene and reduce the number of infections. As well as developing a new technology, there is an additional behaviour change component.				
<b>Patient safety and improving health outcomes</b>	To develop technologies that enable better patient monitoring, accurate transfer and interpretation of data to determine the correct treatment, designing best practice and eliminating calculation errors in medication.	<b>NHS East of England</b>	177	5 contracts Total £483k	No Phase 2 yet
<b>Managing long-term conditions</b>	To develop ideas and technologies that address the remote monitoring of patients combined with decision support to enable better care from home.			5 contracts Total £470k	No Phase 2 yet
<b>Keeping children active</b>	To motivate children to keep active and monitor their activity to beat obesity.			1 contract Total £100k	No Phase 2 yet
<b>Retrofit for the future</b>	To kick start the retrofit market for the UK business and connect the best solutions with UK Government procurement in social housing through developing and evaluating world class innovation in whole house solutions.	<b>Department of Communities and Local Government and Technology Strategy Board</b>	350	193 contracts (20k each) Total £3.5m	87 contracts Total £1.3m
<b>Hot products</b>	To stimulate design-led innovation in the security of mobile phone devices, through improving the security of data stored on mobile devices.	<b>Home Office and Design Council</b>	53	3 contracts Total £300k	No Phase 2 (single phase competition)
<b>Synthetic environments in managed motorways</b>	To explore the use of synthetic environments applied to transport, in this case, modelling and managing complex traffic situations.	<b>Department for Transport</b>	19	3 contracts Total £300k	No Phase 2 (single phase competition)
<b>Energy efficient soldier</b>	To demonstrate fully integrated electronic systems and power system architecture incorporating a central power source with an energy density in the region of 600 to 800 Wh/kg.  Energy Efficient Soldier is one of five tasks within the Reducing the Burden on the Dismounted Soldier Capability Vision, a two-year programme worth £10m.	<b>Ministry of Defence</b>	34	12 contracts Total £513k	4 contracts Value pending
<b>Intent in crowded places</b>	To develop new ways of detecting intent (to commit acts of violence) in crowded places – likely to require more interdisciplinary approaches for cross-department client.	<b>Home Office</b>	55	6 contracts (average £93k)	No Phase 2 yet

## The case study competitions

To gain a more in-depth understanding of progress, achievements and problems, we undertook over 30 qualitative interviews during January and February 2010. We spoke to government departments and agencies, companies, universities and other organisations involved in seven case study competitions. We collected secondary sources where available although very little data is yet available for analysis. Table 2 on page 11 outlines our case studies.

## Benefits on both sides

Discussions about the impact of SBRI have previously focused on the value created for companies that win contracts. This impetus is shifting in the reformed SBRI: our research found that the impact of participation on public sector bodies is strikingly undervalued. This is perhaps best exemplified by a 2008 competition with the National Institute for Health Research (NIHR).

*we have for procuring technological devices...takes about seven years."*

It would also overcome the frustration of knowing that there is considerable expertise in the SME community that the NHS has until now been unable to tap into. The competition gave them access for the first time to those companies working in the food industry that had solved the problem for a different context some time ago.

With the second phase of the competition now in early stages, it is too early to evaluate what the impact of the 13 Phase 1 contracts and upwards of three Phase 2 contracts will be. Regardless of the outcome, advisers felt that the SBRI created an opportunity to focus on *"the big issues superseding the individual, local activity... those things [the Department of Health] ought to be focusing on."*

The SBRI helped the research team to identify what the NHS wants, which is critical for better spending of precious R&D funds. But, as one advisor put it: *"the corollary of that, the other side of the coin, is having said 'this is what the NHS wants,' all the SMEs said 'fantastic, at long last, we know what you want. We'll do it for you'."*

## View from the company

The British healthcare system is a unique market opportunity, with the NHS alone accounting for 85 per cent of the UK's medical technology market.<sup>27</sup> £34 billion was spent on commercial suppliers by the Department of Health and NHS England last year.<sup>28</sup> But it is also an extremely difficult market to crack. Companies like Cambridge Design Partnership, a technology development consultancy with first-hand experience of trying to work with the NHS, are all too aware of this. Having recently wound up a company that never quite managed to tap the scale of opportunity, the SBRI presented a unique chance, not only for a 100 per cent funded R&D contract, but to access NHS procurement.

In their application, CDP teamed up their hand-held micro-processor platform with unique biosensor technology

## Eradicating superbugs: a win-win solution

The NIHR launched an SBRI pilot competition to help eradicate hospital superbugs. With MRSA treatment costing an average £9,000 a case, the total cost nationally runs into billions of pounds a year. The competition sought to address the dual challenge of detecting pathogens and improved hand hygiene. While existing technologies addressed each issue in isolation, they hadn't overcome the range of behavioural and compliance challenges that mean an effective solution remains elusive.

## View from the Department

When approached by the SBRI team at TSB with an offer to help them run a competition, scientific advisers realised what a valuable addition this could be to the suite of measures, from Rapid Review Panels to Showcase Hospitals, introduced in recent years to transform the capacity of the NHS to take up technology.

*"Why did we give SBRI this problem to solve? We suddenly realised the immediacy. We were going to get quick answers. Every other procurement process*

27. UK Medical Technology Market Environment and Context - May 2009. Supporting document for the Ministerial Medical Technology Strategy Group-SME Competitiveness Working Group meeting, May 2009. Department of Health, UK.
28. Department of Health National Innovation Procurement Plan, December 2009. Available at: [http://www.dh.gov.uk/dr\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh\\_110178.pdf](http://www.dh.gov.uk/dr_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh_110178.pdf)

from Universal Sensors and expertise from Nottingham Trent University on appropriate tests. After winning Phase 1 funding in 2009, the resulting mobile testing device, PathGenFinder (an enzyme-linked immunosorbent assay) is now starting Phase 2 and should be in production by 2012. This fast, easy to use handheld device will be able to detect pathogens like MRSA and C-difficile in minutes, replacing the need to wait days for lab results.

CDP finds SBRI unrivalled by other R&D funding. One Director described it as *“like adding nitrous oxide to a fuel injection system.”* With few of the constraints of other public funding schemes, it is *“high quality money”* that focuses a company on rapid delivery of a solution.

But it's not just the direct effect of contract funding that affects company prospects. Just winning a Phase 2 contract has attracted five new investors to Universal Sensors, including a potential multinational investment worth £30 million. If this succeeds, it will be a coup not just for the companies involved, but for the region.

Comparing these two viewpoints highlights the multi-directional benefits of the SBRI. We now look at each in greater depth, starting with that of the public sector.

### 3.1 Solutions on tap? Public sector experiences of SBRI

It can be difficult to persuade government departments with increasingly restricted R&D budgets that they should run SBRI competitions simply to support the growth and development of the country's high-tech SME base. It would be easier to make the case if there were clear, rapid and direct benefits from participation. Our analysis has indicated that SBRI can uncover new and innovative solutions to operational challenges through accessing a larger range of suppliers from varied market sectors. It can also be used to address policy challenges when a departmental lead customer can pilot solutions. More than this, the SBRI competition management process comes with an ethos of procurement that is not only focused on outcomes, but on helping to

identify and communicate challenges. Adopted and applied to appropriate problems, the SBRI could help transform the public sector approach to innovative procurement.

#### Operational solutions

The superbug competition was an example of an operational problem so severe that it escalated into a national policy crisis. That nine in ten competition entrants had never worked with the NHS before is a striking vindication of the common perception that there are solutions in the SME community just waiting to be tapped. Departments have used SBRI to widen the search for solutions which have proved elusive using other routes.

As well as widening the net to more SMEs, the SBRI enables access through TSB knowledge transfer networks and other outlets to unusual applicants. The NHS East of England's competition for solutions to long-term health conditions included the debilitating problem of asthma, a condition affecting 5.4 million people in the UK and costing the NHS £996 million a year to treat. Over a thousand people die each year from asthma, and 90 per cent of those deaths are preventable. Early diagnosis brings a wealth of benefits, including avoiding the risk of permanently decreased lung function.<sup>29</sup> Yet until now the only means of diagnosis has been a device called a spirometer, into which a patient is required to blow – a difficult task for babies and other at-risk patient groups. The competition uncovered a product used on thoroughbreds in the lucrative horse-racing industry that tested lung function without this requirement. The product made by a start-up called Exhalation Technology is now being feasibility-tested as a hand-held device for use on humans; clinical advisers are very interested in its potential for transforming diagnostic capability.

The SBRI helps departments target new groups of companies where they believe likely solutions will be found – for instance the Department of Transport used SBRI to access video games developers' 3D imaging skills to model synthetic environments to help improve motorway management. Yet it also widens the net when it is unclear where solutions might come from. For the Home Office's counter-terrorism group, the challenge set through SBRI was how to identify people with intent to commit violent acts in crowded places. Over and above scanning for weapons, this aimed to tackle the growing need to predict violent human behaviour. Six Phase 1 winners ranged from university research groups to

29. Portnoy, J.M. and Jones, E.M. (2002) Diagnosing asthma in young children. In: 'Current Allergy and Asthma Reports.' 2002, 2(6), pp.447-52.

major defence contractors. Technologies under development include those to identify behavioural patterns in CCTV and ways to analyse changes in human odour due to stress.

This competition was managed through the Ministry of Defence's Centre for Defence Enterprise (CDE). Launched in May 2008, the CDE is a gateway between the MoD and the outside world. It is designed as a single point of contact for new ideas and solutions that could be developed and procured to ensure the forces have access to the best possible technology. The CDE is aligned with the SBRI, with the team providing support for shaping the process and the networks providing access to the maximum range of new suppliers. The competitions so far include the 'Energy Efficient Soldier,' part of a drive to reduce the weight of equipment that soldiers on foot patrol must carry.

### Centre for Defence Enterprise (CDE)

Watching a soldier tour the auditorium, wincing and grimacing under the weight of the 70kg load he carries on foot patrol was an eye-opener for the 450 technologists, researchers and entrepreneurs gathered at the CDE open day in March last year. The day was designed to launch a call for solutions to reduce the burden on the dismounted soldier, giving participants an unusual opportunity to see first hand the difficulties faced by armed forces as they carry the essential communications and IT equipment, rations, batteries, body armour and weapons required for a day's work. Technologists could discuss the challenges directly with those who needed their help, providing a critical insight into the problem.

Power supplies are a central concern. For some missions, the battery sources required to power the electronic equipment of a modern soldier can contribute up to 30 per cent of the load. This competition sought a 'revolution' in power systems rather than an evolution – with the competition format allowing them to target 'high risk, quick win' solutions.

From systems for energy scavenging to alternative energy sources, proposals for the Energy Efficient Soldier were diverse. One of the winners was Intelligent Textiles, which produced an army uniform capable

of conducting electricity and computer data through conductive yarns, enabling troops both to power electrical equipment and run internal heaters for warmth, whilst reducing their burden by at least 2kg.<sup>30</sup> Unlike some defence technologies, which can take decades to develop, this equipment will be ready to pilot in theatre by 2011.

In addition to the targeted calls for specific solutions, the CDE also accepts a second stream of unsolicited ideas in a monthly open call. While only 10 per cent of these receive first phase funding, compared to 30 to 40 per cent of applicants for targeted calls, these are still surprisingly good odds for a small business. And with decisions made in as little as 15 days, with contracts placed five days later and IP retained by the company, the risk is limited. Some might think that opening up access to the MoD in this way could lead to a deluge of inappropriate proposals, but the MoD estimates that ten out of every 100 proposals are very powerful, and could have improve national defence capabilities.

Research and development activities account for around £2.6 billion of the Government's £30 billion annual defence budget. With a drastically new set of threats in the last decade and a public purse under pressure, the CDE is one way in which the MoD is using open innovation techniques to ready its R&D capabilities for a new era. Its experiences could have powerful lessons for other parts of government.

While most competitions so far have sought solutions to operational problems, early evidence suggests that they make fruitful contributions to solving policy challenges.

### Solutions to policy problems

In recent years, policymakers have emphasised the potential for public procurement not only to generate and diffuse technological innovation, but to stimulate demand in the private sector for technologies that could solve public policy challenges. By acting as a 'lead user' it shares the risk of developing and refining novel products. This signals a market potential that can shape subsequent commercial opportunities.<sup>31</sup> One, albeit anomalous, competition has illustrated better than most the potential for SBRI to help departments address policy

30. As featured in Coghlan, T. (2010) Robot Hand Could Protect Soldiers on the Battlefield. In: 'The Times,' 12 February 2010. Available at: [http://technology.timesonline.co.uk/tol/news/tech\\_and\\_web/article7024216.ece](http://technology.timesonline.co.uk/tol/news/tech_and_web/article7024216.ece)

31. Aschoff, B. and Sofka, W. (2009) Innovation on demand – Can public procurement drive market success of innovations? 'Research Policy,' 38, pp.1235-1247.

challenges. 'Retrofit for the future' has allowed government to seek out and test ways to reduce the impact of housing on the environment.

## Retrofit for the future

The UK target for an 80 per cent reduction in carbon emissions by 2050 requires some major changes in the way we live. Housing accounts for almost a third of UK carbon emissions. Since more than 60 per cent of the houses we will be living in by 2050 have already been built, we need drastically to reduce the carbon emissions of our existing stock, 20 per cent of which is social housing for which government is responsible. A Heat and Energy Saving Strategy consultation published by the previous government detailed a radical shift in ambitions to improve the energy efficiency of homes, setting a target of retrofitting seven million homes by 2020. Yet the Retrofit market in the UK is hampered by a lack of funding and an underdeveloped supply chain.

The TSB worked with the Department for Communities and Local Government, using the SBRI in combination with the TSB's Low Impact Building Innovation Platform, to try to drive the market for environmental retrofitting. The SBRI competition provided 100 per cent contracts for 'whole dwelling solutions' to environmental retrofitting, with a golden opportunity to test the solution in real homes.

With an original target of 50 demonstration prototypes, 139 companies won Phase 1 feasibility funding, with 87 so far taken forward to Phase 2 development. Against this background, it proved possible to connect the future procurement needs of registered social landlords and local authorities with the capability of innovative suppliers to develop high performance and cost effective solutions.

To 'kick start' the retrofit market, dissemination and scaling up of the solutions is already underway. With around 100 'showcase' demonstrator homes spread across the UK there is a wealth of information around the emerging supply chains and new innovative technologies, which can be drawn upon to stimulate

the sector. This could lead to a real step change in the retrofit market.

Another example of how the SBRI has helped departments address policy objectives is the 'Hot Products' competition to reduce the volume and impact of mobile phone crime.

With 228 mobile phones stolen every hour, mobile phone crime is already a considerable problem in the UK. But the growing trend for 'm-commerce' – where financial transactions are conducted on the mobile phone – will result in increasingly sensitive and valuable information being held on mobile phones. With mobile phone churn a profitable aspect of business for mobile companies, there is concern that they are not devoting enough resources to developing secure devices. As part of the *Design out Crime* competition, SBRI has helped the Home Office and Design Council to run a competition for technology to make mobile phones and the data they hold harder or less desirable to steal. Although the products will not be directly procured by the Home Office, the intention is to stimulate market development in more secure devices, limiting data theft. The three Phase 1 winners, new initiatives between design and technology firms, presented their technologies at the World Mobile Phone congress in Barcelona in January 2010. A fourth winner, which had revisited dormant IP for the competition, was bought by a manufacturer during the competition.

In the 'Hot Products' competition, there was never an intention that government would procure the resultant technology, rather that it would use SBRI to signal a market opportunity to other companies. This was unusual, since linking government research and development activities with procurement opportunities is a fundamental feature of SBRI. In fact, despite the uniform nature of the process, it was adopted in various ways by departments and agencies. At most basic, SBRI was viewed as an effective process for managing R&D contract competitions and a way to access a far larger and more diverse pool of SME suppliers through the TSB's knowledge transfer networks. But where it was used as a means of growing a new ethos of using procurement to drive innovation – a trigger for behaviour change – indications are that the effects on a department or agency are likely to be deeper and more sustainable.

### **Transforming innovative procurement**

For the NHS East of England, the SBRI was an opportunity not only to develop new relationships with a previously untapped regional supply base of SMEs, but also to fulfil the challenging objectives set out by Lord Darzi in his 2008 review of the NHS. Thanks to the collective management of the SBRI process, the strategic and procurement functions are learning how to work as a continuous unit. *“The funding from TSB, [and EEDA] was symbolic of the government’s commitment to supporting this transformation...while the money was helpful, the TSB expertise and time was critical.”*

While some of the impacts of the SBRI on the public sector are emergent and complex, the benefits for small businesses are already striking.

### **3.2 An SBRI sunrise? Benefits of SBRI for small businesses**

*“SBRI is one of the very few sunrises on the horizon.”*

Company Director, Intent in Crowded Places

SBRI accelerates technology development in two important ways: by spurring companies to complete a demanding contract and by providing access to increasingly scarce funding. In today’s challenging climate for raising development finance, SBRI is more welcome than ever. Unlike other means of R&D funding, the 100 per cent funded contract means that development is not held back while private match funding is sought; indeed it acts as an endorsement that helps companies attract more funding later. As one winner of the Retrofit competition said: *“It has allowed a fully developed programme of projects to hit the ground running. I’m sounding astonished because I am astonished; this is just not how funding works anywhere else.”*

In fact, companies found that the indirect benefits were frequently even more valuable than the direct contract funding. The experience of Universal Sensors highlighted earlier was not confined to the healthcare market. Instead it was shared by a large proportion of companies interviewed. As one contract winner in the Hot Products competition revealed: *“The whole point of being involved in this competition wasn’t the financial contribution, it was to be associated*

*and endorsed by a government body; this gives so much confidence to potential investors”.*

In the same way, participants in the Retrofit competition found that market signalling by the public sector could transform company viability: *“It has opened up an access, a route and a focus on an area of business that we have already been interested in, but it has allowed us to step into the world with weight and backing.”*

While the peer review and due diligence involved in the SBRI process can be a huge boost to capacity to raise private funds in the future, the SBRI also permits government to back ideas that might not attract traditional venture capital funding, yet could have potentially transformative effects on public service delivery. One such example is EcoRoute.

Cambridge-based micro company, EcoRoute, has long wanted to develop new incentives to change people’s behaviour so that they reduce carbon consumption. But their business had never really taken off before an NHS East of England competition to monitor children’s activity in order to tackle childhood obesity provided them with a new business opportunity. Supported by product development consultancy, Cambridge Design Partnership, a company with SBRI experience, they submitted a bid which was the only successful contract of the competition. Their technology, a miniature biometric monitor worn on the child’s wrist that monitors physical activity, encourages children to walk or cycle to school, highlighting the combined health and environmental benefits of doing so. It is combined with a school-based system for collective monitoring that hopes to tap into the power of peer motivation both to increase the amount of exercise taken by children and to cut carbon consumption. Though the results may not be clear for some time, it has indicated the potential for whole system solutions through SBRI.

Similar to the NHS pathogen detection competition described earlier, the opportunity to work closely with the public sector on solution development here increases the chance that the solutions will be capable of addressing both the technological and behavioural aspects of public sector challenges.

While the impact of participation in SBRI varies according to the competition, the TSB/DCLG competition for the environmental retrofit of social housing stock appears to have had a

uniquely large multiplier effect on the business community beyond direct contract winners. This probably reflects the unusually large scale of the initiative, with 193 first phase winners and 87 second phase winners guaranteed an opportunity to demonstrate their solutions in situ in social homes. Some companies reported depleted supplies of raw materials like solar panels due to the surge in demand, while others found the new community of suppliers generated to be the most remarkable feature of the competition. *“It has opened up a whole network of small companies that are developing new products which are about to come to market... it has increased our knowledge base quite dramatically.”*

In addition to those companies funded by the competition, it has driven the development of the wider supply chain. Wattbox, a small company which has developed a new energy saving heating controller system was operating as little more than a serious hobby for the founders. Yet by developing supplier relationships with Phase 1 winners, its founders have given up their jobs to concentrate on the venture full time. *“By being involved in the competition... quite literally we have created jobs and are moving forward as a business, where previously it had just been a development process”*. The value of the relationships and supply chains created is expected greatly to surpass the initial funding generated through the programme.

### 3.3 A new lease of life for the SBRI? Challenges ahead

The majority of the interviewees in our sample were using SBRI for the first time. In order to ensure that this re-launched SBRI represented a genuinely new lease of life for the scheme we also spoke to departments engaged in SBRI since 2001. One is the Food Standards Agency (FSA).

With an annual research and development budget of around £20 million, the FSA had previously used SBRI to fund evidence-based research for policy and to hire consultants who qualified as small businesses. There was nothing unique about SBRI, and they saw no extraordinary value in participating. Yet in its new guise, they feel the SBRI has something different to offer. The FSA is in discussions with TSB to run four potential competitions from its 30 work programmes. According to one scientific adviser: *“The key is to be selective –*

*SBRI won’t work for everything, but for those applications where it can, it adds unique value.”* One competition being considered is for new measurement equipment that will form the basis for a widespread transformation of food safety standards. In its new version, *“SBRI is not just about solving the problem, but creating a platform for further innovation.”*

While the process continues to evolve and improve based on the feedback of participants, a number of incremental improvements will be required that are not the focus of this report. However, important issues regarding the communication and evolution of the SBRI also need to be addressed.

*The first is the need for clarity regarding the SBRI process.* The research found that failure to manage expectations can damage the SBRI brand. While procurement of the technology by the contracting agency is a desirable end, this is not a guaranteed result. Our research found mismatched expectations amongst companies. One competition winner regarded Phase 1 funding as *“almost like a blank purchase order”* whereas others expressed severe disappointment and frustration where a competition did not follow the standard SBRI process and progress to a Phase 2 competition following Phase 1 feasibility funding. The mobile phone security competition, Hot Products, managed by the Design Council, only adopted the SBRI process late in competition development. Even though it was only intended as a single phased competition, companies read the SBRI literature and assumed it followed the two-stage format. Confusion and misunderstanding left companies feeling disenfranchised. As one company who secured Phase 1 funding in Hot Products complained: *“It is pointless giving us money if it’s not then going to be delivered to market, it’s a waste of money.”* There is a balance to strike between promoting the unique proposition of the SBRI in creating new pathways to public sector procurement and allowing unrealistic expectations to breed.

*The second is clarity regarding the SBRI ethos, and the need to distinguish the SBRI from other innovation competition management tools.* For departments and agencies there is an important balance to strike. When the SBRI is adopted only as a competition management tool, indications are that the effects on the department or agency are positive, but limited. The Department for Transport competition in our sample was a case in point. Although the SBRI helped the departmental team



achieve their aims of accessing a wider pool of SMEs from new industry sectors, the SBRI was regarded as simply '*a.n.other tool*' for competition management. However, if the SBRI process represents a broader ethos, it does appear to be capable of transforming public sector capacity to promote innovation. For NHS East of England, which adopted and adapted the SBRI process to suit their particular needs with support of the TSB, the relationships created within the local public sector spanning R&D and procurement has transformed its capacity to create demand for innovation. Adopting and owning the process and its ethos was far more effort-intensive than competition management. Yet by improving the NHS's understanding of how to identify urgent needs and communicate them effectively to the SME community, "*SBRI has given us a tool we can use from now on and a whole new way of doing things.*"

*The third is ensuring that a spectrum of tools for driving demand for innovation develops alongside SBRI.* The scheme can help leverage the power of government demand for solutions to generate and accelerate innovation in small companies. It provides a route to interacting with government that can elsewhere be hard to come by. It is too early to say how many of these competition winners will go on to win supplier contracts with their innovations, and in this intermediate stage we are not yet seeing the true power of government as 'lead customer.' Indeed there remain concerns that there are still major hurdles to overcome before this process is integrated with mainstream procurement. Those individuals who do strategy and R&D procurement can be very disconnected from mainstream procurement – with different skills, cultures and targets. However we are seeing government's potential as 'lead demonstrator.' Platforms for technology demonstration such as showcase hospitals for the NHS, show homes for DCLG or major demonstration exercises for the Home Office are likely to have a considerable impact on the speed of uptake of these new technologies both within and outside the public sector.

## Part 4: Conclusion and recommendations

Europe has so far failed to fully exploit the opportunity of using public procurement to drive innovation. To put things in context, the US public sector spends around 20 times as much as Europe on procuring R&D, a factor that accounts for around half of the overall gap in R&D investment between the US and Europe.<sup>32</sup> While the US and some Asian countries have well-established mechanisms for pre-commercial procurement, despite being a thought-leader in the area, the UK is still on a steep learning curve in terms of implementation.

With the Netherlands, the UK was one of the first in the EU to develop an SBIR-type scheme. However, in the first incarnation from 2001 to 2008, that opportunity was largely wasted. The first competitions in the re-launched scheme since 2009 will not result in final products for at least another year. Yet with careful stewardship, our analysis indicates that the scheme has finally taken a form in which it can deliver on its potential.

The SBRI is an appealing concept because of the three-way benefits it promises:

- a. Driving improvements in the quality and cost-effectiveness of public services and helping solve policy challenges.
- b. Accelerating the commercialisation of technology and filling a damaging gap in innovation financing.
- c. Supporting the growth of small companies and consequently economic growth and recovery.

To ensure that those benefits are maximised, we make three main recommendations:

First, scale up the SBRI scheme in the UK to optimise its impact on public bodies, and to reach many more promising small companies.

Second, focus on quality with any increase in the number of competitions, to ensure that the SBRI remains an effective source of genuine innovation.

Third, recognise the SBRI as a powerful tool in a wider system of demand-side policy levers for driving innovation. These should not be overlooked or watered down to focus solely on short-term efficiency rather than long-term innovative capacity. It is worth looking at each recommendation in more detail, to suggest ways to achieve them.

### a. Scaling up the SBRI scheme

There are two main ways to increase public sector take up of the SBRI: incentivising participation or mandating it. Mandates have been ineffective in the past and risk damaging perceptions of the SBRI. While the latest Government commitment to spend 15 per cent of overall procurement budgets on small businesses is a positive signal, it is still very low compared to the 23 per cent spent directly with small businesses in the US (roughly 45 per cent if one includes indirect expenditure with SME's as sub-contractors).<sup>33</sup> While expenditure on SBIR is mandated in the US, experience suggests that this would be very difficult to monitor in the UK, and could lead to unsuitable competitions being funded that would not have the desired impact.

Research has suggested that incentives are likely to be far more effective. In fact, the

32. European Commission (2006) 'Pre-commercial procurement: A missing link in the innovation cycle.' Luxembourg: Office for Official Publications of the European Communities. Differences in defence and space spending make up a lot of the contrast, but when these are taken out of the picture, the US still spends four times as much on public procurement of R&D than Europe.
33. Richard, D. (2008) 'Small Business and Government: The Richard Report.' Submission to Shadow Cabinet, The Conservative Party, Appendix D.

successful roll-out of the reformed SBRI to date has been in part due to the complementary funding for competitions provided by the TSB, in addition to personalised support. Early successes of the scheme will help sell the idea to other departments, agencies and teams within them. However, as we have already seen, severe cuts to departmental budgets could put R&D spending under pressure and thus diminish take up.

If financial incentives are unavailable,<sup>34</sup> Government should carefully monitor the roll out of SBRI to support the TSB to ensure departments can be encouraged and incentivised to participate in other ways.

Provided these factors are in place, there should be scope to increase the value of SBRI contracts awarded from £27 million this year to £50 million next year and £100 million a year after 2011.

Scaling up is very unlikely to be equal between departments. In the USA, health and defence make up the vast majority of the competition value. A similar distribution would be likely in the UK. The Centre for Defence Enterprise is a successful model for coordinating competitions and increasingly, integrating them with other procurement procedures. The Department of Health could use this example to consider ways

of coordinating competitions across regions and innovation groups.

There are still additional untapped areas of the public sector for SBRI. One of these is the Research Councils. David Connell has made the case for how Research Councils could benefit from adopting SBRI tools for some areas of funding, particularly those relating to scientific instruments and other research tools for which academic research labs can act as lead customers, the platform for a considerable amount of innovation in the UK.<sup>35</sup>

These changes could put the SBRI on a very different growth trajectory than in its early stages. Figure 3 compares the stages of SBRI roll-out.

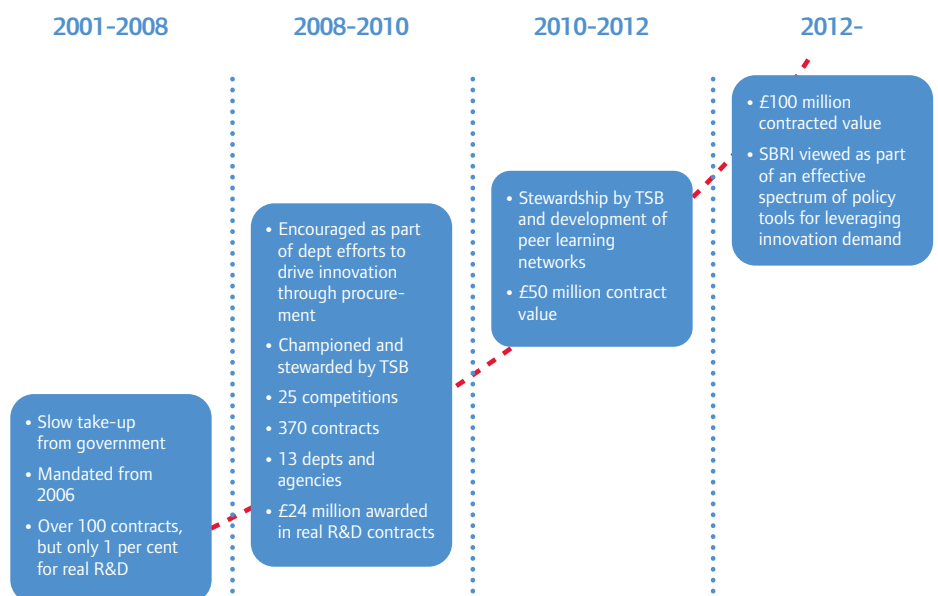
### b. Quality control for SBRI

In our research, we found that the impact of the SBRI can vary according to how it is employed. Those public sector users that engaged the SBRI process very early, particularly in designing and describing the problem area, were more likely to find the process transformative. While the process was regarded as effective when used purely as an innovation competition management tool, it

34. The announcement in the March Budget of £10 million a year over two years as core funding for new competitions to scale up the SBRI scheme was reversed as part of plans to reduce spending by £6.2 billion announced in May 2010.

35. Connell, D. (2010) 'Scientists are customers too: How the SBRI can help Research Councils drive economic growth.' London: NESTA.

Figure 3: SBRI growth trajectory



was less likely to have as great an impact on innovative procurement practices and create systemic changes.

A certain degree of flexibility in the SBRI is important to permit public sector bodies to adapt the model to their own preferences and to the needs of particular competitions. However, for the long-term successful roll-out of the SBRI, it is essential that it retains the core set of principles that create its value proposition. These are summarised at the end of the chapter.

We suggest three ways in which these principles can be maintained:

- a. Maintaining the Technology Strategy Board ‘stewardship’ role of the SBRI. TSB offers valuable support to public sector agencies to choose and shape competitions and gain the maximum value from SBRI. Co-funding of competitions is likely to help embed this role early on.
- b. Ensuring an open data policy. Transparency and a rigorous means of performance evaluation are essential to the future success of the SBRI. Data on competition winners and the subject and value of awards should be collected and made publicly available (as in the USA). Additionally, data on applicants who applied but did not win contracts should be collected to enable economists to track the economic impact of the SBRI.
- c. Developing peer learning networks. Collaboration and information-sharing between public sector competition clients will become more beneficial as the SBRI concept and practice become embedded. Sharing success stories could be particularly valuable in helping to transform practices around procurement of innovation.

### **c. Boosting demand for innovation**

In the UK, a raft of reviews and initiatives over the last decade have emphasised the importance of demand-side drivers to pull innovation to market, and particularly the potential of public procurement to leverage innovation. The best-practice guidance produced in the UK is undoubtedly an international point of reference. Yet we frequently seem to underestimate the challenges of implementing this – from skills

shortages to cultural barriers to a lack of evidence about the likely benefits. There is still much work to do if means of driving demand for innovation are to be embedded as standard practice for public sector bodies, even as private sector expectations continue to rise.

This research indicated that the SBRI is more likely to be effective if it is one of a spectrum of ways to support the use and development of innovative technology. The UK doesn’t fail to reach its potential for innovation because of a lack of ideas. Instead, this happens because those ideas get ‘marooned’ in an innovation system that still doesn’t offer enough avenues to translate them into viable commercial products. We need to ensure the end results of SBRI competitions do not suffer this fate. Mainstream procurement contracts should be one of several integrated routes for technology development in the public sector that include demonstration platforms (such as showcase hospitals and show homes) and targeted schemes to maximise technology pull from universities.

These are still early days for the new SBRI, and we need to monitor the roll out of the scheme closely to ensure it reaches its potential impact. But, for now, the outlook is promising; the UK must avoid repeating the mistakes of the early SBRI and make the most of this valuable opportunity.

## Acknowledgements

The authors would like to thank all the public bodies and companies who gave up their time to participate in research interviews. We are grateful to Mark Glover and his team at Technology Strategy Board (TSB) for access to data and fruitful discussions throughout. We would also like to thank David Connell at the Cambridge Centre for Business Research for his helpful insights and commentary during the research. Any omissions or errors remain our own.

**NESTA**

1 Plough Place  
London EC4A 1DE  
[research@nesta.org.uk](mailto:research@nesta.org.uk)

[www.nesta.org.uk](http://www.nesta.org.uk)

Published: June 2010  
BP/55

