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HOUSE OF LORDS

Science and Technology Committee

1st Report of Session 2010–12

Public procurement as a tool to stimulate innovation

Report

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Science and Technology Committee

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Report

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See Appendix 1

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References in footnotes to the Report are as follows:

- Q refers to a question in oral evidence as listed in Appendix 2;
- PP 1 refers to written evidence as listed in Appendix 2.

SUMMARY

In 2009–10, the public sector spent over £236 billion on procurement. The Government is the single largest purchaser in the United Kingdom. This magnitude of expenditure provides enormous potential to influence the development of innovative solutions, to improve delivery of public policy and services and to encourage economic growth. Yet that potential is not being realised.

During the course of this inquiry we have been left with the impression that the overarching problem lies at the very heart of government. Despite the efforts that have been made to make government procurement more effective, there remains a culture within government departments and other public sector organisations which inhibits—or may even be antithetical to—the adoption of innovative solutions. It appears to us that when procurement decisions are being taken, either insufficient or, worse, no consideration is being given to whether an innovative solution would be preferable, not only in terms of achieving better value for money but also in terms of wider benefits such as the potential to promote economic growth through stimulating new and commercially significant ideas in industry or encouraging the translation of scientific research into innovative goods and services.

This state of affairs has been made worse by the current economic climate. There is a wide-spread perception of a tension between the need to save money on the one hand and adopting innovative solutions on the other—that innovation is seen as risky and potentially expensive compared to the supposedly safer option of tried and tested solutions. This is disappointing. We were therefore pleased that Francis Maude MP, Minister for the Cabinet Office, acknowledged that this perception was a misunderstanding and that efficiency and innovation could be complementary. In this report, we invite the Government to demonstrate how they intend to spread this message to ministers and officials across all departments.

In addition, we identify a number of areas where we think that the Government can take steps to integrate imaginative, innovative thinking into the procurement process and we make recommendations to support this. We recommend, for example, that a single Minister should be made responsible for both procurement and innovation across government and that, further, a Minister should be appointed in each government department with specific responsibility for procurement and innovation within their departments. We also recommend that departmental Chief Scientific Advisers should have a greater role in ensuring the procurement of innovative ideas by their departments, encouraging engagement with industry and academic communities and assisting departments in the formulation of their long-term planning through horizon-scanning activities. Other areas for improvement involve developing the capacity of departments to act as “intelligent customers”, more strategic planning of longer-term procurement and more challenging specification of departmental procurement plans.

In this short inquiry, we looked at government generally and at the Department for Transport in particular. We have touched on a range of issues which we recognise would warrant further investigation. Unusually, a number of our recommendations ask the Government to offer solutions to the problems we have detected, rather than suggesting solutions ourselves. Given that we have concluded that the main difficulty is deep-seated and cultural, we do not think it unreasonable, on this occasion, to expect the Government to use their knowledge of the fundamental workings of government to provide solutions. Our intention is to follow-up this report during the next session (2012–13), in about 12 to 18 months’ time, in order to see what progress has been made against the findings of this report and what plans have been put in place to ensure that improvements are set to continue.

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Public procurement as a tool to stimulate innovation

CHAPTER 1: INTRODUCTION

1. Procurement is “the purchase of goods and services from third parties”¹ and “government is the single largest customer in the United Kingdom.”² In 2009–10, “public procurement was valued at over £236 billion”.³ This magnitude of expenditure provides enormous potential to influence the development of innovative solutions, to improve delivery of public policy and services and to encourage economic growth.⁴ And yet that potential is not being realised.
2. Innovation in procurement is capable of providing three main benefits: first, it could result in a procurement problem being resolved in a more effective and creative way; second, it could lead to better value for money for the tax payer; and third it could stimulate British industry to generate new products and ideas that will, in turn, lead to economic growth, often based on the translation of scientific research into commercial products and services. The Technology Strategy Board (TSB) told us: “at present, most ... procurement is focused on purchasing proven solutions, or is spent with existing ‘proven suppliers’. Even a small percentage of that spend, if used to buy more innovative products and services, could have a big impact on the innovative capability of UK businesses and at the same time provide better public services with the ability to save costs in the longer-term”.⁵ Colin Cram, Managing Director of Marc 1 Ltd, referred to public sector procurement as a “huge resource ... the potential benefit of which is well short of being realised”,⁶ and Iain Gray, Chief Executive of the TSB, described the use of government procurement to stimulate innovation as “a patchy picture” and considering “the sums of money involved ... there is a lot more that could be done”.⁷ The House of Commons Business and Enterprise Committee, in its 2009 report entitled *Risk and Reward: sustaining a higher value-added economy*, said: “There would be clear economic benefits if the Government could use its purchasing power not just to buy goods or services but also to promote innovation and higher added value”.⁸
3. We have been left with the strong impression that the overarching problem lies at the very heart of government. Despite the efforts that have been made to make government procurement more effective, there remains a culture within government departments and other public sector organisations which inhibits—and may even be antithetical to—the adoption of innovative solutions.

¹ *Transforming government procurement*, HM Treasury (January 2007).

² PP 21.

³ *Annual Innovation Report 2010*, BIS (January 2011).

⁴ *Public procurement and innovation—Resurrecting the demand side*, Edler and Georghiou (2007).

⁵ PP 21.

⁶ PP 31.

⁷ Q 53.

⁸ 11th Report (2008–09) (HC 746).

4. We recognise that not all procurement problems require innovative solutions. Some are best resolved by applying those which have been used before. To this extent, we agree with Francis Maude MP, Minister for the Cabinet Office (CO), when he said: "there will be plenty of procurements where a completely well tried and tested approach is the right one, where you don't need or there may not be innovation available".⁹ We also acknowledge that there are occasions when the risks associated with developing a solution which is untried and untested may be disproportionate to the anticipated benefits. It is a matter of assessing and mitigating risk and then making a judgement about how that residual risk weighs in the balance when placed against the potential benefits of adopting an innovative solution.
5. Our concern is that the "tried and tested approach" is not applied only when it is judged to be preferable but that it is the default position. It appears to us that when procurement decisions are being taken, either insufficient or, worse, no consideration is being given to whether an innovative solution would be preferable, not only in terms of achieving better value for money but also in terms of wider benefits such as the potential to promote economic growth through stimulating new and commercially significant ideas in industry or encouraging the translation of scientific research into innovative goods and services. It is with regret that we note this lost opportunity.

Purpose and scope of the inquiry

6. The role of government departments in stimulating innovation was drawn to our attention during the course of the committee's inquiry in 2009–10 into setting priorities for publicly funded research.¹⁰ Lord Sainsbury of Turville, a former Minister for Science and Innovation, contrasted the effective use made of the research and development budgets of the United States Departments of Energy and Defence to support innovation with the less effective performance of United Kingdom government departments. He cited, as an example, the Home Office: "so should the Home Office have a budget which supports the development of innovation in the security industry ...? I think absolutely yes. They are the customer; they have the problem; and they should be driving a programme of innovation in that area".¹¹
7. The purpose of this inquiry is to consider to what extent government and other public bodies exploit the potential of public procurement to encourage the development of innovative solutions; whether the current structures and mechanisms in government which are intended to encourage innovation are effective; and what more can be done. Given the possible breadth of the inquiry, we decided to focus principally on a single government department whilst also considering procurement mechanisms across government more generally. The government department we chose was the Department for Transport (DfT). Our reasons were that it is an example of a government department engaged in significant procurement activity; it has a number of important challenges ahead such as improving traffic management systems and developing low carbon transport technologies; and it has a substantially devolved procurement structure (and is therefore ahead of many

⁹ Q 178.

¹⁰ *Setting priorities for publicly funded research*, 3rd Report (2009–10) (HL Paper 104).

¹¹ *Ibid.*, and Q 51.

departments in terms of dealing with the implications of a further shift to the local provision of services). This report is not intended to provide an in-depth analysis of the procurement practices within the DfT, but rather a "snapshot" of current activities.

8. Whilst much of the evidence submitted to this inquiry echoed similar themes, we were frustrated by a dearth of specific examples, whether of the effective procurement of innovative solutions or of a procurement solution which fell back on the tried and tested when an innovative solution might have been much better. We understand that this may be in part because of commercial confidentiality issues but regret that we were unable to elicit more of this type of evidence.

Definition of "innovation"

9. We received evidence from a wide range of organisations and individuals, and their evidence included a variety of definitions of the concept of "innovation". In a white paper published by the Department for Business, Innovation and Skills (BIS) in 2008, for example, it is defined as "the successful exploitation of new ideas, which can mean new to a company, organisation industry or sector. It applies to products, services, business processes and models, marketing and enabling technologies".¹²
10. We take the view that "innovation", in the context of this inquiry, should be defined broadly. It involves the successful stimulation and exploitation of new ideas for the purpose of resolving a procurement problem effectively and efficiently. These new ideas might be entirely new, developed specifically to meet the requirements of a procurement problem, or they might involve a novel application of an existing innovative idea.¹³ Furthermore, they may involve the development or application of new products or, alternatively, the innovation may be to do with the development of new processes or systems. The definition is wide-ranging but at its centre are the concepts of imagination and creativity, the intellectual leap that marks a development out as progressive rather than "business as usual".
11. Although the inquiry is a broad one, we have imposed some limits. In particular, we have not included innovative approaches to the procurement process itself (such as e-procurement or catalogue and bulk-buying).

Government action

12. In this inquiry, we have attempted to tackle a big subject in a relatively short space of time. We acknowledge that we have touched on a range of issues which would warrant further investigation and that, unusually, a number of our recommendations ask the Government to offer solutions to the problems we have detected, rather than suggesting solutions ourselves. Given that we have concluded that the main difficulty is deep-seated and cultural, we do not think it unreasonable, on this occasion, to expect the Government to use their knowledge of the fundamental workings of government to provide solutions. But devising these solutions will take time. **Our intention is to**

¹² *Innovation Nation* white paper, BIS (March 2008), Cm 7345.

¹³ An example of an innovative procurement solution using an existing technology was the introduction in the Greater London area of the Oyster card by Transport for London in 2003. The challenge was to reduce the use of paper tickets and the number of transactions at ticket offices. An innovative solution was found in contactless technology which, although already in use in Hong Kong, was new to this country.

follow up this report during the next session (2012–13), in about 12 to 18 months' time, in order to see what progress has been made against the findings of this report and what plans have been put in place to ensure that improvements are set to continue. All our recommendations should be read against this timeline.

Structure of the report

13. In the next chapter we look at current Government policy and responsibility for procurement and innovation. Chapter 3 explores procurement and innovation in the DfT while Chapter 4 considers the barriers to innovation within government (with reference to the DfT where appropriate). In Chapter 5 we consider the implications of the Government's current efficiency and localism agendas, the role of small and medium enterprises (SMEs) and the TSB in innovation, and those schemes designed to promote public procurement as a tool to stimulate innovation. Appendix 5 sets out some international comparisons about the use of public procurement as a policy tool.

Acknowledgements

14. The membership and interests of the Committee are set out in Appendix 1, and those who submitted written and oral evidence are listed in Appendix 2. The call for evidence with which we launched our inquiry is reprinted in Appendix 3. On 14 December 2010, we held a briefing session to which representatives from BIS, DfT and CO contributed. A list of those who gave presentations is set out in Appendix 4. We thank all those who assisted us in our work.
15. Finally, we are grateful to our Specialist Adviser, Dr Paul Nightingale of SPRU (Science and Technology Policy Research) at the University of Sussex, for his expertise and guidance during this inquiry. We stress, however, that the conclusions we draw and the recommendations we make are ours alone.

CHAPTER 2: RECENT DEVELOPMENTS IN PUBLIC PROCUREMENT AND INNOVATION POLICY

16. In considering the relationship between public procurement and innovation, a distinction can be drawn between specific schemes designed to promote the use of public procurement as a tool to stimulate innovation (such as the Small Business Research Initiative (SBRI)),¹⁴ and policies intended to embed innovation within the procurement process. Both aspects are important. In this report, however, we focus chiefly on the latter—not least because, at present, innovation through specific schemes represent a very small proportion of overall spend—a little over 0.01% of the overall public procurement budget.

Government policy statements

17. In *Transforming government procurement*, published in 2007, the previous Government set out their “government procurement vision”. It was intended to transform the government’s procurement function so that it would consistently deliver “high quality public services at good value for money” and would be “better able to take advantage of business innovation”.¹⁵ Underlying the vision was a commitment, amongst other things, to provide better scrutiny of, and support for, complex projects, “ensuring that the best, innovative solutions [could] be brought forward and adopted”.¹⁶ The report set out a number of initiatives such as strengthening the role of the Office of Government Commerce (OGC) in setting procurement standards, placing an emphasis on outcome-based specifications in procurement and plans to raise the level of procurement skills within government departments.
18. Also in 2007, Lord Sainsbury published a review of Government science and innovation policies.¹⁷ The review, entitled *The Race to the Top* (“the Sainsbury review”), was commissioned as part of the Comprehensive Spending Review and was charged with considering the role of science and innovation in enabling the United Kingdom to compete more effectively with emerging economies such as China and India. The review argued that value for money and innovation could be complementary objectives in government procurement. It urged the Government to implement plans to improve departmental procurement capability and encouraged the use of outcome-based specifications and the use of departmental R&D budgets through initiatives such as the SBRI and the use of Forward Commitment Procurement (FCP) mechanisms to support innovation.¹⁸
19. The 2008 *Innovation Nation* white paper built on the Sainsbury review. It proposed a range of measures to encourage innovation, based on the premise that innovation was essential to the future economic prosperity of the United Kingdom and to tackling major challenges like globalisation and climate change.¹⁹ The white paper recognised that innovation could be promoted by

¹⁴ For a description of this scheme see paragraph 125.

¹⁵ *Transforming government procurement*, op cit.

¹⁶ Ibid.

¹⁷ *The Race to the Top: a review of Government’s science and innovation policies*, Lord Sainsbury of Turville (October 2007).

¹⁸ For a description of the FCP, see paragraph 129.

¹⁹ *Innovation Nation* white paper, BIS (March 2008).

supply-side measures (such as investment in research) or be demand-led; and that demand-led measures included harnessing the power of government spending to create demand for innovative products and services. Amongst other things, the white paper proposed that each government department should be required to prepare an Innovation Procurement Plan (IPP) as part of its commercial strategy, "setting out how it [would] drive innovation through procurement and use innovative procurement practices". It also set out measures to increase innovative capacity in the United Kingdom through the development of skills.

20. The present Government have acknowledged the importance of public procurement as a tool to stimulate innovation. In July 2010, in his first major speech as Minister for Universities and Science, David Willetts MP said that it was "vital" for the public sector to use its purchasing power "effectively"; that much more might be done to support innovation; and that government's procurement decisions "can have important intended or unintended consequences for innovation".²⁰ Shortly after, in evidence to this committee, Mr Willetts said: "I am very much impressed by the evidence on the role of public procurement ... If we could just use a tiny fraction of [the public procurement budget] as imaginatively as the Americans do, it would be a real contribution to innovation".²¹ And in September 2010, the Secretary of State for BIS, Vince Cable MP, also referred to the role that the public sector could play "as a first customer for innovative products and services" and that he was "committed" to making greater use of the SBRI programme to facilitate economic growth and innovation.²²
21. In November 2010, the Government launched its Growth Review, *The path to strong, sustainable and balanced growth*.²³ The Growth Review "is a rolling programme to last the whole Parliament, with a first report by Budget 2011". Its purpose is to enable "a fundamental assessment of what each part of government is doing to provide the conditions for private sector success and address the barriers faced by industry". The review acknowledges that "public spending ... shapes markets through Government's role as a procurer" but suggests that the current procurement system "works against a competitive market". It argues, in particular, that the system acts as a barrier to "dynamic and innovative SMEs" and that, amongst other things, the SBRI should be used to direct public money towards firms which are developing innovative technologies. The review refers to the Government's *Technology Blueprint*, also published in November 2010, and their "ambition to be the most technology-friendly government in the world"; and it describes the initiatives set out in the *Blueprint* which include, for example, the provision of £200 million to the TSB to establish a network of Technology and Innovation Centres.²⁴ Both the review and the *Blueprint* focus on SMEs as holding significant potential for developing innovative solutions. The *Blueprint*, for example, reiterates the aspiration that 25% of government contracts should be awarded to SMEs.²⁵

²⁰ Speech at the Royal Institution, 9 July 2010.

²¹ Transcript of 13 July 2010, Q 18.

²² Speech at Queen Mary University of London, 8 September 2010.

²³ *The path to strong, sustainable and balanced growth*, HM Treasury and BIS (November 2010).

²⁴ Ibid.

²⁵ *Technology Blueprint*, BIS (November 2010).

Impact of Government policy

22. Professor Luke Georghiou, Professor Jakob Edler and Dr Elvira Uyarra of the Manchester Institute of Innovation Research argued that “the problem lies in the implementation of all those intentions and report recommendations. The complex and changing procurement landscape and the ‘overcrowding’ of the ‘policy through procurement’ agenda has, over time, resulted in a proliferation of guidance and reports which can be confusing, even contradictory, to procurers”.²⁶ David Connell, Senior Research Fellow at the Centre for Business Research at Cambridge University, goes even further, concluding that the “exhortations, guidelines, ‘plans’ and targets have all had virtually no impact”.²⁷
23. The National Endowment for Science Technology and the Arts (NESTA) told us that “the UK, and Europe as a whole, fails to fully exploit the opportunity of using public procurement to drive innovation”. They go on to say that “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’ ... [because there are not] ... enough avenues to translate them into viable commercial products”.²⁸
24. In March 2009, the National Audit Office (NAO) reported: “there is considerable evidence of ... government innovation over the last decade, in the way in which public services are delivered, as well as in the use of technology to improve services and the administration of back office functions”.²⁹ However the NAO report concluded that public servants were still “inhibited from developing innovations through to implementation by risk-averse attitudes and perceptions, and that national performance measures, targets, budgets and national initiatives leave little room for innovation”. The report also said that “central government organisations are not systematically taking the opportunity to use suppliers to generate innovative ideas”, that “departments ... need to manage innovation more systematically”, that “only a few departments have strategies which show that they understand where they need innovation or how to encourage and support it” and that “departments are not currently maximising the opportunities to innovate”.³⁰ The evidence that we have received suggests that little has changed since the NAO report was published.
25. Birmingham Science City stated that “public sector procurement needs to be transformed so that the public sector encourages suppliers to think the unthinkable. This involves a fundamental alteration in the public sector’s expectations regarding procurement. The public sector should not just be interested in obtaining products for the least cost, but should also be concerned with enhancing the resilience of the regional and national economy”.³¹ We agree. In order to effect the transformation required, there needs to be a real culture change at all levels of government, including the highest level.

²⁶ PP 16.

²⁷ PP 13.

²⁸ PP 07.

²⁹ *Innovation across central government*, NAO (March 2009).

³⁰ Ibid.

³¹ PP 05.

26. It is striking the number of documents and reports published in recent years that make recommendations about innovation in public procurement. Yet it is disappointing that we have seen no evidence of a systematic and coherence use of public procurement as a tool to stimulate innovation. We urge the Government to take steps to ensure that there is a fundamental change in the culture within government so that innovation is wholly integrated into the procurement process.

Responsibility for procurement and innovation in the public sector

27. In the context of government policy, responsibility for procurement and innovation policy does not reside within the same government department: whereas the CO takes the lead on public procurement policy, responsibility for innovation policy lies with BIS.³² Responsibility for individual procurement decisions rests with the relevant government department or public sector organisation.
28. The OGC, which in June 2010 transferred from HM Treasury to the CO, works with government departments and other public sector organisations to assist them in achieving a number of goals which include: ensuring best value for money; promoting innovation; and developing central government capability in procurement. Lord Sainsbury placed great emphasis on the role of the OGC in procurement, stressing the importance of the OGC's involvement in the appointment boards of procurement departments. Although his evidence has been overtaken by changes (see paragraph 29 below), he suggested that the OGC's chief executive should produce a yearly report on the state of procurement across government.³³
29. The OGC is now part of the recently created Efficiency and Reform Group (ERG), chaired jointly by the Chief Secretary to the Treasury and the Minister for the CO. The ERG's aim is to drive efficiency improvement and reform in the Government's operations and it is currently working on streamlining the procurement process and moving to outcome-based specifications.³⁴
30. Despite these developments, it appears that responsibility for procurement and innovation remains fragmented. As Chief Scientific Adviser (CSA) for BIS and DfT, Professor Brian Collins is well-placed to comment on this. He told us that "there isn't any one person who describes all the systems that make up the innovative procurement of new capability to modernise the country"³⁵ and he suggested that there should be a Minister charged with looking after "the wellbeing of the operation of the country and everything that flows from that, which is procurement, innovation and growth".³⁶ Iain Gray of the TSB made a similar point. He said that it was "hugely important" that within each government department there should be a Minister who would take responsibility for that department's use of specific

³² PP 18.

³³ Q 104.

³⁴ The Government described "outcome-based specifications" as follows: "A well constructed output specification identifies the outputs from, rather than the inputs to, a requirement. An outcome specification takes this one step further and specifies the end result to be achieved." PP18.

³⁵ Q 67.

³⁶ Q 69.

procurement schemes (such as the SBRI) designed to promote innovation;³⁷ and Happold Consulting commented that "what appears to be missing is a focus on innovation through procurement at the high level".³⁸ Engineering the Future argued that "it might be beneficial if a Minister in each department was given responsibility for ensuring—where possible—procurements within their department's remit serve to encourage innovation".³⁹

31. The Minister, Francis Maude MP, agreed that there had been an absence of high-level commitment to oversight of procurement. In his experience, he said, it had tended to be the case that once a policy had been agreed, responsibility for procurement would "default to a relatively junior level" and that "there has been a marked lack of interest by senior officials and Ministers in what happens with a project after the decision to go with it has been made".⁴⁰ He was optimistic however: "There is a difference between announcing a policy and seeing it through to delivery. I think senior people, both Ministers and officials, need to reflect that and I think the boards, the new and stronger departmental boards that we are currently putting in place, will help with that".⁴¹
32. These developments are encouraging but we are not satisfied that they will be sufficient to bring about the necessary culture change within departments and other public bodies. **We recommend that a Minister should be responsible for both procurement and innovation, charged with ensuring that, where appropriate, innovative solutions are used to meet procurement problems across government. The Minister assigned with this responsibility should formulate a national framework for innovation in procurement which will provide the basis on which government departments, local authorities and non-departmental bodies would work. The Minister should be held accountable for how well procurement decisions are made including to what extent innovative solutions had been considered and the reasons why they had not been adopted.**
33. **Furthermore, there should be a Minister in each government department with specific responsibility for procurement and innovation in order to create a high level network across government with a view to strengthening the link between public procurement and innovation.**

³⁷ Q 81.

³⁸ PP 14.

³⁹ PP 24.

⁴⁰ Q 178.

⁴¹ Ibid.

CHAPTER 3: INNOVATION AND PROCUREMENT IN THE DEPARTMENT FOR TRANSPORT

34. In this chapter we look at the DfT's approach to procuring innovation, the extent to which the DfT has responded to the attempts by governments to encourage innovation through public procurement and what more the department can do. Background information about the DfT is set out in Box 1 below. We recognise that different departments perform differently and our findings in respect of the DfT may not necessarily be applicable to other departments. However, in our view, some more general lessons can be drawn from the evidence we received about the DfT.

BOX 1

The Department for Transport

The DfT is the sixth largest government department in the United Kingdom in terms of number of employees.⁴² In addition to the corporate centre it has seven executive agencies, the largest of which is the Highways Agency (HA), and a further 11 arms' length bodies. The DfT has four strategic objectives:

- Sustain economic growth and improved productivity through reliable and efficient transport networks.
- Improve the environmental performance of transport.
- Strengthen the safety and security of transport.
- Enhance access to jobs, services and social networks, including the most disadvantaged.

Departmental third party spend for 2008–09 was £10.8 billion, of which £3–4 billion took the form of formal procurement.⁴³ The ratio of third party spend to total costs is thought to be higher in the DfT than any other major government department.⁴⁴ The DfT is accountable for other forms of third party expenditure (rail franchising, payments to Network Rail, Transport for London and local authorities) and has different models of governance and leverage over this spend. With regard to pre-commercial procurement,⁴⁵ the DfT spends about £60 million each year on research, some of which is focused on innovation in tackling transport issues through a Research and Technical Consultancy Framework, intended to encourage suppliers to consider innovative solutions in framing tenders.⁴⁶ The DfT has a Transport Research Centre to carry out strategic research “focused on enhancing the evidence base needed to inform key transport policy issues facing the UK over the next decade and beyond”,⁴⁷ and the Department participates in the TSB Innovation Platforms designed to generate innovative solutions within the market.⁴⁸

⁴² <http://www.statistics.gov.uk/pdffdir/pse1210.pdf>

⁴³ Procurement Strategy, DfT (May 2010).

⁴⁴ OGC, *Procurement Capability Review Programme: Department for Transport* (Oct–Nov 2007).

⁴⁵ “Pre-commercial procurement” is a process whereby R&D is procured to explore innovative ideas or products from concept to first test products.

⁴⁶ Innovation Procurement Plan, DfT (November 2009).

⁴⁷ <http://www.dft.gov.uk/pgr/scienceresearch/ee/uktransportresearchcent1902>

⁴⁸ PP 33.

Responsibility for procurement

35. Until recently, the Director of Procurement in the DfT was the departmental lead for “developing and introducing innovative procurement processes and facilitating the procurement of innovative products and solutions”.⁴⁹ During the course of this inquiry, the post (which was vacant) ceased to exist. Currently, the recently created Head of Procurement Profession is responsible for ensuring that the DfT’s procurement policies, processes and procedures can enable innovation. Responsibility for “specifying and identifying innovative products and solutions rests with the appropriate business unit or agency”.⁵⁰
36. In 2007, the OGC published a *Procurement Capability Review* of the DfT. The review concluded that “the DfT Board could play a stronger role in driving commercial performance” and that there was, at that time, “no overarching commercial or procurement strategy at Board or functional level”. But it was also noted that in both DfT and HA there was “considerable good practice” and some that was “genuinely leading edge”, and that rail franchising was “now a very impressive process, which has demonstrated innovation, good market involvement, transparent and robust processes, and successful financial outcomes”.⁵¹ In response, the DfT published an Improvement Plan which set out how it would address the recommendations of the review.⁵² The DfT’s Head of Procurement Profession has responsibility for taking forward capability improvements in procurement. The department published a procurement strategy and an IPP to support this strategy.

Embedding innovation into the procurement process

37. Ministers and senior officials recognise the significance of government procurement as a tool with which to exercise influence and also the beneficial link between procurement and innovation in achieving solutions to procurement problems and impacting on economic growth. This is evident from the number of reports by different governments about promoting innovation and innovative thinking, and by the number of initiatives that have been put in place. We questioned why therefore that understanding has not been translated more effectively into action.
38. The explanation appears to lie at two different levels. The first is the more straightforward. It focuses on how well the Government implements policies intended to encourage innovation through procurement. The second is more fundamental and more difficult to describe and therefore to tackle. It concerns how innovation is perceived within departments; it involves risk appetite and attitudes about risk-taking, the ability for departments and agencies to act as “intelligent customers” and the conflict between achieving short-term policy objectives and responding to long-term challenges. We look at this latter explanation in the next chapter. The former is dealt with in the following sections where we consider the DfT’s IPP, procurement strategy and long-term planning capability.

⁴⁹ Innovation Procurement Plan, DfT (November 2009).

⁵⁰ Ibid.

⁵¹ *Procurement Capability Review Programme*, op cit.

⁵² Ibid.

Innovation Procurement Plan

39. The DfT published its IPP in November 2009. The objectives of the IPP are listed in two categories: (1) innovation in the procurement process (that is, changing the way the department carries out its procurement); and (2) achieving innovative outcomes by delivering innovative solutions to specific requirements.⁵³
40. Although some of the activities described in the IPP are forward thinking—such as the departmental annual Commercial Stakeholders Event to which the top suppliers to the department and transport industry are invited with a view to stimulating innovative thinking—the DfT IPP has been criticised for focusing principally on current activity. David Connell, for example, said that “the DfT Plan describes many challenges and activities, but gives no indication that it plans to commission companies to develop technology and innovative new technologies needed to meet its objectives”. Indeed, he was critical of IPPs more generally on the grounds that, on the whole, departmental IPPs were “very general in nature”.⁵⁴
41. Fergus Harradence of BIS commented that “it would be fair to say that the quality of the plans was variable; some from those departments that had more experience of procuring innovative products and services, such as the Ministry of Defence, were relatively strong. I think others were relatively weak and were perhaps more focused on some of these distinct procurement mechanisms and activities that were under way, rather than being more forward-looking documents of the sort that we were trying to encourage departments to produce”.⁵⁵ But he also said that it was too early to evaluate the performance of departmental IPPs because of the lead time involved in innovation, and that, so far, BIS had only evaluated the quality of the plans themselves rather than their translation into procurement practice.
42. We were struck by the lack of key performance indicators or measurable objectives in IPPs, such as the number of outcome-based specification contracts or the number of times that SBRI and FCP have been used. As a result it is difficult to judge whether a department is in fact delivering the objectives stated in IPPs. The absence of measurable objectives means that IPPs tend to be little more than a statement of good intentions.
43. **We recommend that all government departments, including the DfT, should set out in their IPPs measurable objectives against which success can be assessed and a timetable according to which those objectives must be achieved.**

Procurement Strategy

44. The DfT procurement strategy, last reviewed in May 2010, sets out “how the DfT and its subsidiary bodies intend to achieve added value, innovation and quality through procurement excellence in the delivery of the Department’s business objectives”.⁵⁶ Procurement objectives 1 and 2 in the procurement strategy include a commitment to promote innovation.

⁵³ Innovation Procurement Plan, DfT, op cit..

⁵⁴ PP 13.

⁵⁵ Q 2.

⁵⁶ Procurement Strategy, DfT, op cit.

45. The DfT procurement strategy uses all the right words such as "challenging the 'status quo'", "being creative and open to exploiting new ideas", "being an intelligent client", and we were provided with some examples where a procurement problem had been resolved by an innovative solution. One involved the DfT having to find a way to speed up the time taken to get people on and off trains in order to run more trains on the upgraded Thameslink route for the benefit of passengers and the profitability of the business. A piece of research funded by the Engineering and Physical Sciences Research Council and carried out at University College London was identified through the involvement of the CSA in the consideration of possible technical solutions during the procurement process. After providing £250,000 funding to develop the technology, a solution was found by engineering a train-platform interface. This resulted in the re-examination of the planned infrastructure solution for the project. Crossrail and the Olympic Delivery Authority have both taken note of the Thameslink project with a view to including its findings in their activities for their respective train transport systems.⁵⁷
46. Despite the existence of the departmental procurement strategy and the IPP, Mike Acheson, Divisional Manager of Procurement Policy and Contracts at DfT, conceded: "What may be missing ... is the overarching strategic piece that says, 'we need to look at innovation before we do anything else', which is perhaps one of the key issues for this Committee. The fact that I'm struggling to pinpoint where that may be proves the point that perhaps we are not as hot on that as we could be".⁵⁸
47. Professor Collins told us that there was no mechanism by which innovative knowledge that was created in one part of government was made available or used in another part of government. He suggested that "it's serendipitous ... and the whole idea of innovation around this type of activity is not institutionalised, I think, at a scale that would allow it to deliver against the aspirations that I sense are needed."⁵⁹
48. Happold Consulting felt that the fact that the DfT's departmental strategic objectives (see Box 1 above) did not explicitly cover innovation and procurement was significant. They suggested that it indicated that "high level policy objectives do not mesh clearly with departmental strategic objectives ... Addressing this issue and making innovation/procurement part of their strategic objectives would put the issue at the forefront of public sector procurement, which would be cascaded to the operational level".⁶⁰
49. Although the DfT's procurement strategy and IPP outline a number of activities to support innovation, we have been left with the impression of a department which lacks clarity and apparent understanding about the contribution that innovation can make to the procurement of goods and services and the lack of a coherent strategic plan to ensure that innovation is sought where appropriate.
50. Notwithstanding examples such as the one in paragraph 45, we have been frustrated by the lack of convincing evidence of an understanding within the

⁵⁷ QQ 75, 74.

⁵⁸ Q 14.

⁵⁹ Q 74.

⁶⁰ PP 14.

DfT of the importance of the link between procurement and innovation. The examples that have been provided are relatively few and where an innovative solution has been applied it appears to have been by chance rather than the result of a coordinated and coherent effort to embed innovation into day-to-day procurement decisions. **We recommend that the DfT should identify the additional activities it intends to carry out to ensure that the possibility of innovative solutions to its procurement problems is systematically included in its procurement decision-making processes.**

HA Procurement Strategy

51. The HA is the largest of the DfT's executive agencies and invests in excess of £2.5 billion every year in roads. Around 70% of its budget is allocated to day-to-day operations and maintenance; for example, keeping traffic flowing and the network safe and serviceable. The HA delivers the majority of services through contractors. Its procurement strategy has three central aims: value for money, confidence in delivery, and sustainability.⁶¹
52. Ginny Clarke, the Director of Network Services and Chief Highway Engineer at the HA, described some of the procurement activities that the agency has carried out. She explained that the agency had "produced a procurement strategy that tries to put in a strategic view of how procurement is driving the sorts of requirements for the HA ... [procurement] is a tool to help us deliver".⁶² A number of witnesses were very positive about the HA's approach to procurement.⁶³
53. Balfour Beatty, for example, illustrated the activity of the HA through an example of a unique form of contract in operation in the South of West of England, the Area 2 Enhanced Managing Agent Contractor (EMAC) contract. This type of contract "rewards innovation through specially designed efficiency share mechanisms, along with contractual bonuses for innovation. As a result a number of improvements have been made to the effectiveness and efficiency of road management and maintenance activities".⁶⁴ Charles Penny, a civil engineer, cited this collaboration as "the most enlightened and potentially the most effective that I have seen to date. Savings of hundreds of millions of pounds could emanate nationally".⁶⁵
54. Another example was Managed Motorways. Through the introduction of innovative technology, which is controlled by overhead screens, the HA aims to make better use of the existing road space and tackle congestion. The system consists of two elements: variable speed limits to keep the traffic moving (based on a computer system which calculates the appropriate speed limits from traffic readings) and the use of the hard shoulder during congested times. After a successful pilot on the M42 motorway, the HA is trialling a similar traffic management technique on a trunk road. There are now 35 schemes in total making up the nationwide delivery of the Managed Motorway network. This technology has been sold to the Athens Olympics and other countries.⁶⁶

⁶¹ Procurement Strategy 2009, Highways Agency (October 2009).

⁶² Q 4.

⁶³ PP 31, PP 22, PP 17.

⁶⁴ PP 34.

⁶⁵ PP 22.

⁶⁶ PP 35, PP 37, Q 24

55. **The examples we have received of the HA's use of procurement of innovative ideas are encouraging and should be used to inform the procurement activities of the DfT and its other agencies.**

Long-term strategic procurement planning

56. The importance of long-term planning is widely recognised. Invensys Rail, for example, told us: "the adoption of a well-defined long-term strategy for the railways is essential. This will help to ensure that the rail industry and its suppliers have a clear vision of how the railway will be expected to develop over the next few decades (rather than the next few years) by articulating the infrastructure and technological development that will be required and the long-term public and private investment that would be needed to pay for it".⁶⁷ A recent report by the Royal Academy of Engineering stated that "new infrastructure will need to be built consistently with adaptation requirements"⁶⁸ ... Infrastructure procurement needs to take future climate and weather conditions into account".⁶⁹
57. David Connell also referred to the need for a longer-term view: "Government ... [needs to] work with suppliers, particularly lead suppliers and systems builders plus probably the TSB in order to identify areas where component technology is required in the future and trying to ensure that that's available", but he commented "I'm not sure I see that happening at present".⁷⁰
58. We asked Transport for London (TfL) what activities they were carrying out to future-proof London's transport network over the next 50 years or so. Andrew Quincey, Director of Group Procurement for TfL, said: "a lot of our long-term horizon planning is set by the London Plan, which is a 20-year view ... I would not have said we do anything longer than 20 years".⁷¹ He also said that he was not, as part of his role in procurement, "looking ahead in terms of sustainability over the window you are discussing".⁷² We were later reassured by TfL that long-term planning, such as adaptation to climate change, was being taken into consideration. They told us that "TfL's current climate change adaptation programme has been developed within the context of the UK Climate Projections which were published in 2009 and look ahead to the year 2100".⁷³ This apparent discrepancy inevitably caused us to question whether this a matter of as high priority as it should be.
59. Johnson Matthey Plc suggested that the Government should make better use of procurement to create lead markets for low carbon technologies.⁷⁴ Lord Bhattacharyya commented that: "in the US, agencies such as the Defence Advanced Research Projects Agency (DARPA) have been very successful in

⁶⁷ PP 26.

⁶⁸ The infrastructure will have to be flexible enough to be able to cope with possible changes in weather patterns, such as very high temperatures, caused by climate change.

⁶⁹ *Infrastructure, Engineering and Climate Change Adaptation—ensuring services in an uncertain future*, The Royal Academy of Engineering (February 2011).

⁷⁰ Q 47.

⁷¹ Q 164.

⁷² Q 170.

⁷³ PP 40.

⁷⁴ PP 10.

the use of 'demonstrators'⁷⁵ and 'grand challenges' in driving innovation through procurement" noting that the "UK national practice [of the establishment of demonstrators] remains modest in scale".⁷⁶

60. Professor Georghiou argued that "roadmaps and, in general, Foresight-type approaches are an important tool in promoting the idea of innovation in procurement".⁷⁷ David Willetts MP, Minister for Science and Innovation, concurred: "one area where the scientific community can make a contribution to innovation is through exercises like the Foresight exercise, which comes much further upstream and does try to identify future needs, future challenges, areas where there are grand challenges".⁷⁸
61. The role that departmental CSAs can play in formulating long-term planning strategies was highlighted by work undertaken by Professor Collins for HM Treasury on modernising the national infrastructure network over the next 40 years through the formation of an Innovation and Growth Team. Such teams involve Government, industry and academics talking about what the roadmap will be for their product or service over the next 30 to 40 years. This project asks the question "what are the critical things that we need to invent, innovate or discover, in order to allow us to be where we want to be in 2050, still keeping the lights on, low carbon, economic growth, social values, and adapting to climate change?"⁷⁹ Ginny Clarke of the HA also gave an example of CSA involvement in long-term planning efforts within Defra, referring to the CSA "working with a particular project Defra were leading on, looking at adaptation across providers".⁸⁰
62. **Long-term strategic procurement planning needs improvement. In particular, grand challenges, such as adapting to climate change, should be taken into account in public procurement decisions.**
63. **The involvement of departmental CSAs is essential if horizon-scanning activities within departments are to be carried out effectively. We recommend that government departments should set out in their IPPs how these plans support departmental long-term planning and horizon-scanning, over the next several decades (in the case of departments that procure long-lived infrastructure projects, the very long-term planning should be carried out over the life of the infrastructure). Such plans should be formulated in consultation with Foresight and departmental CSAs. The long-term plan should be kept under review and include technology roadmaps and measures against which the appropriateness and effectiveness of the plan can be assessed.**

⁷⁵ A device or object used as a model to support a theory.

⁷⁶ PP 02.

⁷⁷ Q 47. Foresight is part of BIS. Its role is to "use the latest scientific and other evidence combined with futures analysis to tackle complex issues and help policy makers make decisions affecting our future".

⁷⁸ Q 183.

⁷⁹ Q 75.

⁸⁰ Q 29.

CHAPTER 4: BARRIERS TO INNOVATION

64. In this chapter we consider the barriers which generally inhibit the promotion of innovation through public procurement and explore possible solutions. They can be grouped into the following broad categories:
- lack of capability, expertise and incentives;
 - risk aversion;
 - need for more effective engagement between procurers, suppliers and academia; and
 - overly prescriptive and burdensome procurement processes.
65. The Government acknowledge that many of these barriers exist but say less about what they are doing to tackle them.⁸¹

Lack of capability, expertise and incentives

Lack of capability and expertise

66. A number of witnesses commented on the lack of capability and expertise in procurement departments in public sector organisations and at the local level in particular. The Manchester Institute of Innovation Research, for example, told us:
- “Procurement has a low profile in many public sector organisations, particularly at the local government level, limiting the ability of procurers to make strategic decisions, engage with the market and ensure compliance with guidelines and strategic decisions within their organisations. Decentralised procurement settings are characteristic of many parts of the public sector, meaning that many procurement decisions are taken without involvement or even knowledge of the procurement professionals. Besides a poor use of procurement skills which could be employed to promote innovation, additional shortcomings include poor internal communication, lack of compliance and inconsistent standards. In many parts of the public sector, we cannot speak of reliable customers, let alone intelligent customers.”⁸²
67. The term “intelligent customer” refers to the combined capability of procurers and commissioners to understand the business and needs of the organisation and to articulate those needs to suppliers competently with a view to procuring the best solution. As Lord Bhattacharyya put it, “to be an ‘intelligent customer’ you have to understand the technology and potential added value opportunities as well as effective procurement processes and financial rigour”.⁸³
68. The TSB stressed the importance of the government acting as an “intelligent customer”:
- “When government behaves as an intelligent lead customer, engaging with business in the pre-commercial stages of product development, it

⁸¹ PP 18.

⁸² PP 16.

⁸³ PP 02.

can not only generate more effective and efficient solutions to its own issues, but can also support economic growth, working with business to develop globally competitive products and services. In an ideal situation, Government acting as an intelligent lead customer, would engage with business, widely articulating unmet and emerging needs, specifying challenges at a system level and focusing on desired outcomes rather than specific products. Government would also be willing and able to engage in the product creation process providing input, guidance, test and validation of the solution and ultimately be part of the market, or an enabler of the market.”⁸⁴

69. A survey report of the local government procurement agenda published by the Office of the Deputy Minister in 2005 found that formal procurement training remained rare for both corporate and departmental procurement staff, and that “just 50% of authorities [had] any staff with the most commonly held qualification, the Chartered Institute of Purchasing and Supply ... graduate diploma”.⁸⁵
70. The TSB commented that “public sector organisations ... rarely have the in-house expertise to be able to keep abreast of the latest technologies and innovations or reach beyond the normal supplier base”.⁸⁶ Professor Georghiou observed that “even among the professional community their expertise tended to be honed in the art of procurement, on recent developments such as e-procurement and so on, and not necessarily in how to handle innovation”.⁸⁷ However, he also distinguished between the expertise necessary for procurement professionals and the capability of commissioners because, as he put it, “the process starts before the procurement professionals come in. It starts with those who are commissioning the innovations, and their expertise and involvement is important as well”.⁸⁸ A recent report by the Office of Fair Trading (OFT) stated that it was “vital” that “commissioners and procurers in the public sector are competent and strategic buyers, fully aware of market dynamics”.⁸⁹

Lack of incentives

71. In addition to the lack of capability and expertise, a lack of incentives to take risks and seek innovative solution is a barrier. The TSB argued that “greater recognition and incentives are required that reward investment for longer-term benefit”.⁹⁰ TfL claimed that “there is currently very little incentive for the public sector to use procurement as a means to stimulate innovation. Public sector buyers are not rewarded for procuring innovation. Generally, the focus is upon savings or doing more with less. Innovation can be a way of achieving both of these goals, but this is often not explicit and there is conflict with short-term savings targets”.⁹¹

⁸⁴ PP 21.

⁸⁵ *Evaluation of the Local Government Procurement Agenda*, ODPM (2005)..

⁸⁶ PP 21.

⁸⁷ Q 36.

⁸⁸ *Ibid.*

⁸⁹ *Commissioning and competition in the public sector*, OFT (March 2011).

⁹⁰ *Ibid.*

⁹¹ PP 25.

72. But Dr Charles Wessner of the US National Academy of Science warned that "changing the incentives in procurement to accept greater risk is more difficult than is commonly believed ... career incentives for procurement officers tend to support the selection of established products rather than promising prototypes whose production at scale, timely delivery, and quality assurance may be problematic".⁹²
73. **The Government's capacity to act as an "intelligent customer" is limited by the level of procurement skills and knowledge in departments and the absence of incentives to procure innovative solutions. Providing training courses is not good enough. Departments need to recruit procurement staff with demonstrable expertise and experience. We invite the Government to set out what further steps they intend to take to bring about a marked change in their capacity to act as an "intelligent customer".**

Risk aversion

74. There is a widely-held view that officials working in government departments are risk averse; and evidence suggests that there is a perception within government departments, including the DfT, that choosing an innovative, as opposed to a tried and tested, solution is risky. For this reason, there is an inevitable tendency within government departments against adopting innovative solutions.
75. Lord Bhattacharya observed:
- "There is ... a public sector 'risk aversion' issue to deal with. Civil servants do not wish to be seen to 'gamble' on innovation, and so cannot anticipate future developments as well as those in the private sector. There is a need for culture change that supports those who make breakthrough changes, not financially but through career/recognition."⁹³
76. Engineering the Future made a similar point: "specific actions are required to increase technical knowledge in the civil service and to reduce risk aversion amongst government procurers".⁹⁴
77. Iain Gray of the TSB thought that the problem was getting worse: "I think that one of the issues around the professionalism and skills side of it is the whole issue of the understanding of risk and aversion to risk. I think in the climate that we operate in at the moment there is an increasing aversion to risk".⁹⁵
78. It is not only external observers who recognise a culture of risk aversion in the public sector. The view is shared by officials and ministers as well. Martin Rowark, Head of Procurement at Crossrail, for example, put the question "when you are trying to buy a programme of the scale of Crossrail do you want innovation at every turn?" His answer: "... not necessarily, because with innovation you do import risk".⁹⁶ TfL identified risk and risk aversion as factors which inhibit innovation both within the transport

⁹² PP 01.

⁹³ PP 02.

⁹⁴ PP 24.

⁹⁵ Q 54.

⁹⁶ Q 151.

industry and within the public sector more generally and proposed that the traditional approach whereby risk is allocated heavily to the supply side should be reconsidered.⁹⁷

79. Francis Maude MP, the Minister, referred to “a risk-averse culture” as a result of which there was a tendency for potential bidders to have to show that they had a track record of providing the product or service being procured. He told us that “unless you have shown that you have done almost exactly this kind of thing before in the public sector you don’t even get on to the bidding list”, thereby excluding “new suppliers who do not have a track record but who nonetheless may be the source of a very innovative, may be groundbreaking solution”.⁹⁸ With regard to the DfT specifically, Mike Penning MP, Parliamentary Under-Secretary of State at the DfT, recognised risk aversion as a problem within the department and conceded that “it has been very difficult to establish how we get away from the risk-averse attitude” because “it is much simpler to just do what you have always done before”.⁹⁹

Dealing with risk aversion

80. Some witnesses stressed the importance of sharing the risks and rewards of procurement activities and the need to incentivise those working in procurement to take appropriate risks. In the example in paragraph 51 above from the HA, within the Area 2 EMAC contract, the risks and rewards of the procurement were shared by both the supplier and the procuring body, providing incentives to the supplier to find innovative solutions, which resulted in significant improvements in the service provided. Balfour Beatty told us that “the majority of our major infrastructure projects incorporate incentives in the form of pain/gain share arrangements in the contract”.¹⁰⁰
81. Ginny Clarke from the HA also gave us an example of how a specific fund can help to incentivise the consideration of innovation and to spread the risks and rewards of an innovative approach:

“We have a research and development budget from the department, we use that to run trials effectively. So we can offer the thing they [suppliers] can’t do. They can’t trial it on the road without us being involved, so our money usually goes into offering the trial opportunities for those sorts of things. That evidence is then shared within the industry; that is the rule we have to have. If we’re going to do it with one supplier, we need to share and they have to buy into sharing that knowledge. Then effectively that knowledge is passed back out into the supply chain and then it’s for the commercial activity to take over.”¹⁰¹

82. **Ministers recognise that risk aversion inhibits both the commissioning, and offering, of innovative solutions, but it is not clear how this recognition is being translated into action. The Government should identify what steps they will take:**

(a) to offset risk aversion within government departments;

⁹⁷ PP 25.

⁹⁸ Q 178.

⁹⁹ Q 183.

¹⁰⁰ PP 34.

¹⁰¹ Q 33.

- (b) to ensure that the balance between risks and rewards in procurement contracts is properly managed and shared to encourage innovation where it is warranted (for example having an element of the procurement budget set aside for innovation); and
- (c) to show how they intend to demonstrate the success of this policy and the timeframe in which they anticipate achieving that success.

Effective engagement between procurers, suppliers and academia

83. According to the Design Council, "the development of relationships between suppliers, clients and stakeholders has been acknowledged as a key driver of innovation"¹⁰² because early engagement and dialogue with potential and current suppliers could help to improve the design of procurement specifications and procurement outcomes, enabling Government to act as an intelligent customer.¹⁰³ In their submission, Professor Georghiou, Professor Edler and Dr Uyarra made a similar point: "industry needs a clear communication of needs" from government to enable suppliers to plan for procurements and to come forward with more innovative solutions;¹⁰⁴ and, on the supply side, industry and academics needed to communicate how advances in technologies could be of value to procurement professionals now and in the future.¹⁰⁵ They also referred to the need for "the public sector [to] much more systematically collect and allow for pro-active unsolicited proposals, i.e. firms that approach the public sector with an innovative idea (one example being the 'right to bid' in DWP)".¹⁰⁶ This idea was supported by Colin Cram and the TSB, who suggested that the NHS National Innovation Centre or the MoD Centre for Defence Enterprise could be built on and extended to the rest of the public sector so that "suppliers with innovative ideas could have them assessed and if considered suitable could be promoted in the public sector".¹⁰⁷ The TSB suggests that "similar structures in other parts of central government might remove some of the fragmentation and lack of ownership that exists in some areas" and that the TSB could play a larger role in such activities across government.¹⁰⁸
84. The Government have made some effort to improve communication with key suppliers. Francis Maude MP has been leading a programme of negotiation with government suppliers to develop a Memorandum of Understanding and, although the primary objective has been to save money, the Government argue that the resulting improvement in relationships "will permit far more open dialogue about innovative approaches than have happened before".¹⁰⁹
85. As regards the DfT in particular, its IPP sets out various ways in which the department engages with suppliers at departmental level. These include an

¹⁰² PP 29.

¹⁰³ PP 19, PP 29, PP 14, PP 16, PP 25.

¹⁰⁴ PP 16, PP 30.

¹⁰⁵ PP 13, PP 25.

¹⁰⁶ PP 16.

¹⁰⁷ PP 31.

¹⁰⁸ PP 21.

¹⁰⁹ PP 18.

annual Commercial Stakeholders Event with top suppliers which is intended to encourage early supplier engagement and allows suppliers an opportunity to “suggest improvements and innovation”.¹¹⁰ This is accompanied by more detailed engagements between different directorates within DfT and stakeholders of specific markets. In addition, the DfT is a partner in two Innovation Platforms run by the TSB, to develop low carbon vehicles and intelligent transport systems and services. The platforms bring together representatives of policy, business, government procurement and research and resource perspectives to generate innovative solutions to meet policy objectives.

86. Notwithstanding the example above from DfT, we are concerned by the apparent lack of connectivity between industry, government and the academic community and, in particular, the lack of effort to identify developments in science and technology of relevance to departmental procurement needs.
87. **We recommend that CSAs should have responsibility for encouraging engagement with industry (including both suppliers and potential suppliers) and academic communities with a view to promoting the procurement of innovative solutions. In particular, CSAs should ensure that mechanisms are in place to develop a stronger connection between the department and the science base so that procurement officials are better informed about the availability of innovative ideas. This role should be incorporated into departmental objectives.**
88. **On the basis of the evidence which we have received, we recommend that departments, through the CSA, should either:**
 - **set up a mechanism similar to the MoD’s Centre for Defence Enterprise or the NHS National Innovation Centre, to encourage the submission of proactive unsolicited proposals from industry or academia; or**
 - **ask the TSB to play a more active role in such activities within their departments.**

Prescriptive and burdensome procurement processes

89. We received a range of evidence about the complexity of government procurement processes. Colin Cram, for example, suggested that “new and innovative suppliers are deterred by unnecessarily complex tendering procedures, anti-innovative specifications and can be discriminated against by not having done previous business in the public sector that can be used as a reference”.¹¹¹ This comment reflects those made by Ministers when describing the risk adverse culture of the civil service (see paragraph 79 above) where the tried and tested is given greater priority over the innovative. The TSB suggested that “the bid process can be complex and time consuming especially for SMEs and the selection criteria and due diligence can often count against SMEs”.¹¹² We discuss SMEs further in Chapter 5.
90. In March 2011, the OFT reported that “over-complex and burdensome procurement policies and processes can disadvantage suppliers, or suppliers

¹¹⁰ Innovation Procurement Plan, DfT, op cit.

¹¹¹ PP 31.

¹¹² PP 21.

with less experience of supplying to the public sector. ... This can dampen competition in the market and potentially reduce innovation".¹¹³

91. Francis Maude MP agreed that the procurement process was overly burdensome: "the very process-heavy approach to procurement has resulted in massively highly specified tender documents with prequalification that has been very demanding". He explained that the newly formed ERG, based in the CO, was focusing on this issue with a view to developing "an approach to procurement that is much simpler, where the overwhelming objective is to procure effectively and with an emphasis on value for money".¹¹⁴
92. In Francis Maude's view, this approach, together with a "decisive move towards procurement and commissioning based on outcomes and outputs",¹¹⁵ would encourage and enable innovation to take place more effectively. Other witnesses, such as the TSB, also stressed the significance of outcome-based specification.¹¹⁶
93. Simplifying the procurement process must be a helpful development, and we are encouraged that the ERG has been charged with this task. Colin Cram, however, put the impact of the ERG in perspective. He noted that the ERG was concerned "with central government only and thus the spend being addressed amounts to £13bn—out of a total public sector procurement spend of over £200bn a year. The 25% savings target would thus equate to £2.6bn if achieved. However, this would represent a saving of little more than 1% of public sector purchase spend, which is well short of what is needed overall".¹¹⁷
94. **We note that the ERG is charged with simplifying the procurement process and we welcome this development. We invite the Government to explain when this simplification will be achieved, by what criteria they will judge its effectiveness and whether it will impact, by example, other areas of public sector procurement.**

¹¹³ *Commissioning and competition in the public sector*, OFT, *ibid.*

¹¹⁴ Q 176.

¹¹⁵ *Ibid.*

¹¹⁶ PP 21.

¹¹⁷ PP 35.

CHAPTER 5: TIGHTENING THE LINK BETWEEN INNOVATION AND PROCUREMENT

95. During the course of this inquiry a number of issues emerged which impact on the link between innovation and public procurement. Some involve fundamental aspects of the Government's approach to governing, such as the current localism and efficiency agendas. Others involve mechanisms such as the SBRI and the FCP. We also consider the role of SMEs and the TSB.

Localism

96. Some witnesses expressed concern about the diffuse character of procurement budgets. Professor Georgiou, Professor Edler and Dr Uyarra told us that "the procurement landscape in the UK is fragmented and complex. The OGC estimates that there are over 40,000 points of procurement across the public sector, with complex layers of policy, regulation, best practice and partnerships, as well as a multitude of buying organisations and consortia that seem to compete with each other over similar geographies or service offerings".¹¹⁸ Colin Cram argued that:

"Public sector procurement, despite improvement and some excellent examples of procurement organisations, is fragmented and expertise varies hugely. Its structures are a legacy of its past and a prisoner of the way the public sector is structured. Its structures are therefore inward and not outward looking. Overall, it is not fit for the purpose of delivering value for money for the tax-payer. Expecting it overall to deliver 'higher level' objectives is wishful thinking, though some individual organisations are able to do so."¹¹⁹

97. Despite this diffusion, we received some evidence of communication between national and local authorities. Ginny Clarke gave us an example of how information is shared between the HA and local authorities under the UK Roads Liaison Group: "we use that forum for sharing knowledge, and I need to acknowledge, some local authorities have given us ideas; it is not always about the HA generating ideas. Looking at, particularly, challenges on climate change, I think is very much all of us looking for the best approach that can be identified however that is".¹²⁰
98. Professor Collins, however, was critical of the current state of the dissemination of information to local authorities and confusion over responsibilities for procurement at different levels. In his experience, he said, local authorities found it difficult to access information on the innovation potential available to them. He told us: "I think we need to re-examine the governance issue in a political sense ... of how we manage the balance between national, regional, local and cities".¹²¹ What was needed, he said, was "an open debate about how we construct a different governance mechanism from the one we have at the moment, which allows more innovation to be more likely to occur".¹²² Birmingham Science City also

¹¹⁸ PP 16.

¹¹⁹ PP 31.

¹²⁰ Q 22.

¹²¹ Q 56.

¹²² Q 58.

commented on the absence of connectedness between different levels of government:

“One obstacle comes from the organisation of both national and local government into a series of stand-alone silos. This means that it is difficult to develop a common approach to procurement at the level of a city council or local authority and this difficulty is replicated throughout Whitehall as well as the European Commission. Overcoming this difficulty requires a strong steer on behalf of the national government that public procurement should be considered as a valuable tool to enhance local economic development.”¹²³

99. In this context we asked Francis Maude MP how a commitment to innovation would be promulgated to all levels of government and the public sector. We were surprised by his answer. He said:

“Well, we can just say and promote it. We will not seek to mandate how local government procures. ... We will be quite mandatory about central government ... but we will not seek to impose that on local government nor on the increasingly mixed economy in the NHS.”¹²⁴

100. **The Government’s *laissez faire* approach to the dissemination of best practice in procurement from central to local government appears to be overly optimistic. We recommend that the Government should put in place a system whereby examples of procurement of innovative solutions can be shared across central and local government. The Government should set out what steps, and when, they will take to implement a system of dissemination and indicate how they will assess its effectiveness.**

Efficiency agenda

101. The relationship between innovation and efficiency is complex. Some of the evidence we received suggested they were in conflict with the effect that, in the current economic climate, innovation would be driven out by the need to save money. TfL said: “there is currently very little incentive for the public sector to use procurement as a means to stimulate innovation. Public sector buyers are not rewarded for procuring innovation. Generally, the focus is upon savings or doing more with less. Innovation can be a way of achieving both of these goals, but this is often not explicit and there is conflict with short-term savings targets”.¹²⁵ Sally Collier, the Director of Procurement Policy and Capability at the CO, told us that “there is an absolute driver—there has been since the new administration—on using public procurement to seek value for money”.¹²⁶ Professor Georgiou feared that the current demands for efficiency and short-term cash savings “could take us to the lowest common denominator and towards off-the-shelf goods rather than innovative ones”.¹²⁷
102. The Manchester Institute of Innovation Research, however, suggested that one of the justifications for using public procurement to stimulate innovation

¹²³ PP 05.

¹²⁴ Q 182.

¹²⁵ PP 25.

¹²⁶ Q 11.

¹²⁷ Q 37.

was that the procurement of innovative solutions made public services more effective and efficient. They argued that “the current austerity budgets may at first sight go against this rationale, as the entry cost of innovations tend to be higher than when procuring an established product or service” but this, they pointed out, would be to fail to take appropriate account of “life-cycle costing and enhanced benefit (long term cost-benefit)”.¹²⁸ The Association of Independent Research and Technology Organisations (AIRTO) advocated “more comprehensive economic comparisons involving whole-life costing”.¹²⁹ They suggested that “potential suppliers are competing on immediate price against offers that do not embody the same innovation and functionality and this price tends to be an over-riding consideration, rather than whole-life cost”.¹³⁰

103. When we asked Frances Maude MP about the apparent tension between savings and innovation, he took a positive view: “in order to drive the much better value for money that is essential in the current fiscal climate we need to enlist innovative solutions ... that is a kind of basic proposition that we have to articulate clearly much more vividly than we have done thus far”.¹³¹
104. **We welcome the Government’s recognition that efficiency and innovation can be complementary and that this message should be communicated throughout the public sector, including local government. Getting this message across is part of the wider issue of a need for a root and branch cultural change in attitude towards adopting innovative solutions to which we have already referred in this report.**

The role of SMEs and large companies in stimulating innovation

105. “There are 4.7 million SMEs in the United Kingdom, constituting 99.9% of all businesses; they employ 59% of the private sector workforce and are responsible for 52% of business turnover.”¹³² Many witnesses commented on the positive contribution that SMEs make to the economy and their important role in encouraging innovation. Some witnesses however felt that the Government has placed too great an emphasis on their role in stimulating innovation within current policies.
106. In November 2010 the Government published a document entitled *Backing Small Business*¹³³ which outlined how they intend to promote small business to drive competition and innovation in markets. The package of improvements supports the Government’s aspiration that 25% of government contracts should be awarded to SMEs. The recently published *Blueprint for Technology*¹³⁴ and the first report of the Growth Review, *The Plan for Growth*¹³⁵ (see paragraph 21 above) include further commitments to use

¹²⁸ PP 16.

¹²⁹ PP 12.

¹³⁰ Ibid.

¹³¹ Q 182.

¹³² *Accelerating the SME economic engine: through transparent, simple and strategic procurement*, HM Treasury (November 2008).

¹³³ *Backing Small Business*, HM Government (November 2010).

¹³⁴ *Technology Blueprint*, op cit.

¹³⁵ *The Plan for Growth*, HM Treasury and BIS (March 2011).

procurement as a lever to support innovation in new technologies by continuing investments through the SBRI and other measures.

107. Andrew Wolstenholme, Director of Innovation and Strategic Capability at Balfour Beatty, told us that "many of the great inventions have come from SMEs with only half a dozen people".¹³⁶ David Connell also emphasised the importance of SMEs in stimulating innovation: "new markets are rarely large enough to attract the ... attention [of large corporations]. I would point also to data on patenting, job-creation, high technology employment and exports from the United States Small Business Administration. ... This data shows that small firms play a pivotal role as agents of innovation in the US".¹³⁷
108. Colin Cram, however, argued that "we have had a preoccupation of SMEs in Government policies, wrongly ... we've focused on SMEs when we should have been focusing on innovation, because SMEs are possibly one vehicle for innovation".¹³⁸ He added that "there is little evidence to support assumptions that greater use of SMEs will lead to more innovation. The Government's target for use of SMEs has probably been exceeded for many years, but this has not necessarily brought the anticipated benefits".¹³⁹ Work commissioned by Colin Cram on local-level procurement showed that that "the proportion of public sector contracts let to SMEs is unlikely to be less than 30% ... it seems that this percentage has remained reasonably stable for many years".¹⁴⁰
109. In 2008 the then Chancellor of the Exchequer set up an advisory committee, led by Anne Glover, to report on action needed to reduce barriers to SMEs when competing for public sector contracts. In November 2008, the committee published its report, *Accelerating the SME economic engine: through transparent, simple and strategic procurement* (the "Glover Report"). Professor Georghiou, a member of the advisory committee, told us that "there is not very strong evidence that SMEs are more innovative than large firms, it needs to be said. I think we cited some data in the Glover Report that they spend a smaller proportion on their R&D, for example, but they do have a slightly bigger percentage of new products and services in their turnover: 9% compared to 7%". He went on to say that "where we thought [SMEs] were important and why it is important to stimulate innovation in that sector is that they do give us a greater variety and competition that should, in itself, support innovation, and they are willing to go into smaller niche markets that large firms might neglect. But it's not an overwhelming case to say that they are more innovative, and therefore schemes that encourage all sizes of firms to get involved in innovation through procurement are very welcome".¹⁴¹
110. With regard to the Government's 25% aspiration for SME contracts, Professor Georghiou commented that "our conclusions were ... that there should not be a quota. We believe that this would distort certain sectors and in fact be very difficult to measure, and if you count supply chains we might already be over the quota that is currently proposed".¹⁴² Intellect supported

¹³⁶ Q 128. In the UK an SME is defined as having 250 employees or less. In the USA a small company is defined as having less than 500 employees.

¹³⁷ PP 13, PP 38.

¹³⁸ Q 132.

¹³⁹ PP 31.

¹⁴⁰ Ibid.

¹⁴¹ Q 44.

¹⁴² Ibid.

this view: "our SME members (in accordance with the results of the Glover Review) have stated that they prefer to not have such market distortions and simply desire a level playing field on which to compete. The UK government therefore needs to ensure clarity of information and opportunities and make the procurement process as fast and cheap as possible".¹⁴³

111. Although there were differences in opinion about the relative importance of SMEs in stimulating innovation, there was general agreement that, at present, there were significant barriers to SMEs taking part in procurement which needed to be addressed. They include lack of transparency and availability of contract opportunities, and an overly bureaucratic, complex and costly bidding process. The Glover Report suggested that opportunities should be transparent, the process as simple as possible, and that a strategic approach to procurement should encourage innovation. The previous Government accepted the recommendations in full, including the main recommendation that there should not be a quota of government contracts awarded to SMEs.¹⁴⁴
112. **SMEs and large companies both have a role in developing innovative solutions. However, given the conflicting evidence about the contribution of SMEs in promoting innovation, we invite the Government to explain their current policy on SMEs, particularly the aspiration that 25% of government contracts should be awarded to SMEs.**

Opportunities for SMEs to innovate through the supply chain

113. Particular issues arise for the significant number of SMEs which sub-contract to government through larger companies. These were highlighted in the Glover Report.
114. Andrew Wolstenholme told us that for large infrastructure projects "delivery partners [contracts] are normally awarded to large organisations able to draw on resources from large pools and with a depth and breadth that would be able to demonstrate experience of projects of a similar scale and nature". The challenge was therefore to allow SMEs to interact with these companies. Mr Wolstenholme noted that "it is still possible to design a procurement strategy that accommodates both large and small companies to deliver innovation—even on large transport projects".¹⁴⁵

He added that

"if you go down into the layers of supply chain then you'll come across companies of all different shapes and sizes. You'll be surprised by how many SME organisations are there to support with good ideas, innovation and value. I think the constraint here is to create a project environment where you have open innovation through the vertical slots of the supply chain and to create the opportunity where those companies with good ideas can get to the surface."¹⁴⁶

115. However, Professor Georgiou, Professor Edler and Dr Uyarra, in their submission, said that "despite existing OGC guidance on these issues,

¹⁴³ PP 19.

¹⁴⁴ Ibid, Q 44.

¹⁴⁵ PP 34.

¹⁴⁶ Q 128.

contracting authorities tend to lack the more sophisticated approach to supply chain management which could promote innovation. Again, this is especially pertinent for SMEs, which tend to suffer unfavourable terms and conditions when operating within the supply chain".¹⁴⁷

116. Happold Consulting noted that "currently procurement only engages with the principal supplier with whom the client will enter into the contract. However, a great deal of service is delivered by the supply chain and much of the innovation is driven by these specialists sub-contractors. If these lower tier suppliers were actively engaged ... from an earlier stage in the process then more innovative solutions can be brought out and incorporated into the contract".¹⁴⁸
117. TfL told us that "a possible way forward is in public sector buyers managing their supply chain so that SMEs get the chance to pitch to tier one suppliers (prime contractors). TfL use the web-based portal CompeteFor to advertise lower value opportunities to SMEs and are requiring tier one suppliers to do the same".¹⁴⁹
118. **The Government should set out what support they are giving to SMEs acting as sub-contractors, and what they are doing to improve contract management across the supply-chain to encourage innovation.**

The role of the Technology Strategy Board

119. The TSB describes itself as "the prime channel through which the Government incentivises business-led technology innovation".¹⁵⁰ It was established in 2004 as an advisory board to government on business research, technology and innovation priorities for the UK, including the allocation of funding across priorities. Currently the TSB operates as a non-departmental public body with BIS as its sponsor. The TSB is a business-focused body. Its mission is "to promote and support research into and development and exploitation of science, technology and new ideas for the benefit of business, in order to increase sustainable economic growth and improve the quality of life".¹⁵¹ The TSB fulfils its mission by a combination of collaborative research and a range of networking programmes such as Knowledge Transfer Partnerships (KTP) and Knowledge Transfer Networks (KTN).
120. KTNs were set up to improve the transfer of knowledge within and between specific technology areas. KTNs are funded by government, industry and academia. According to a 2008 survey conducted by the TSB, "the most highly rated functions of KTNs, [were] monitoring and reporting on technologies, applications and markets; providing high quality networking opportunities; and identifying and prioritising key innovation related issues and challenges".¹⁵²
121. Fergus Harradance of BIS told us that the Government envisage a wider role for the TSB: "the Technology Strategy Board will assume the functions of

¹⁴⁷ PP 16.

¹⁴⁸ PP 14.

¹⁴⁹ PP 25.

¹⁵⁰ PP 21.

¹⁵¹ www.innovateuk.org.

¹⁵² Ibid.

the Regional Development Agencies (RDAs) and will become, in effect, the innovation agency for the UK. It will not be the only public sector agency responsible for innovation, but it will be the only one with a cross-economy, entirely cross-sectoral remit, covering the whole United Kingdom. I see it playing an increasingly pivotal role within the innovation system".¹⁵³ Juice Technology, a company which provides innovative solutions to manufacturers of LED lighting, thought that this move was a positive step that was already yielding results: "the centralisation of [the RDAs] innovation function within the TSB has already shown improvement and will move further over the coming years".¹⁵⁴

122. However, Fergus Harradance acknowledged that the TSB has been given responsibility for an increasing number of high-profile Government initiatives and cautioned "we need to ensure that we equip the TSB with the wherewithal to deliver the programmes that we're asking them to deliver for us".¹⁵⁵
123. **The TSB has an important role in innovation and that role is about to be expanded. We invite the Government to explain how the TSB will discharge its extra responsibilities within current resources and also what steps they will take to ensure that the work of the TSB is used by government departments to improve their capabilities for innovation procurement.**

Schemes designed to promote public procurement as a tool to stimulate innovation

124. Two public procurement mechanisms which have been used to stimulate innovative solutions were drawn to our attention by several witnesses. They are the SBRI and FCP.¹⁵⁶

The Small Business Research Initiative

125. The SBRI enables innovation in products and services through the public procurement of R&D. It was launched in 2001 but the uptake was very poor. It was subsequently re-launched in April 2009 following recommendations by the Sainsbury review. It is a pre-commercial procurement process which provides 100% funded R&D contracts. It does not involve state aid. The SBRI process comprises the following stages: identifying a challenge where existing solutions are not available or not good enough; communicating the challenge through TSB channels following which an open competition is run; those companies with promising solutions are awarded R&D contracts to test the feasibility of their solutions (phase 1 funding); companies passing the feasibility test can then apply for further funding to develop a working prototype (phase 2 funding); finally, the resulting commercial product or service is taken to market and open to competitive procurement.¹⁵⁷ The scale of the SBRI is relatively small: the total value of SBRI competitions has been running at less than £25m a year¹⁵⁸ in the context of a total public sector spend of £236 billion.

¹⁵³ Q 31.

¹⁵⁴ PP 03.

¹⁵⁵ Q 34.

¹⁵⁶ PP 18, PP 21.

¹⁵⁷ PP 37.

¹⁵⁸ PP 13.

BOX 2

Examples of procurement through the SBRI

- In July 2009 the DfT and the HA ran a competition through the SBRI programme to explore ways in which synthetic environments (virtual reality) could be applied in the transport industry to model and manage complex traffic problems on motorways. Nine viable competition entries were received and three companies were awarded £100,000 contracts to develop a prototype model. One of the prototypes produced was a simulator which combines a traffic flow model of a 17km section of the M42 with a virtual reality version of the route. The behaviour of lorries, cars, vans and motorcycles are simulated for a range of scenarios including different weather conditions, lane closures, speed limits, road debris and accidents with a view of managing congestion and incidents. This prototype has been identified as a practical and innovative solution with potential for further exploitation.¹⁵⁹
- In April 2009 the Home Office and the Design Council ran a competition to develop innovative and marketable solutions to make mobile phone handsets and the data stored on them, harder or less desirable to steal. A total of £400,000 was offered to winning teams of designers and technology specialists to develop their products. Three different solutions have been found: innovative encryption systems; a key card associated to the mobile telephone to make payment transactions; and a blue tooth device that helps protect against physical loss of an electronic device. "As a result of the competition Proxama, one of the successful companies, is now working closely with both MasterCard and Visa, who believe that the mobile phone will eventually be used as a wallet where multiple cards are kept. This has obvious security implications. The work with Visa also focuses on the forthcoming Olympics, where they are expanding the wallet concept, so that vouchers and tickets to events can be sent to mobile phones."¹⁶⁰

126. Despite its very small scale, witnesses have generally been positive about the SBRI. David Connell, for example, commented that the SBRI was "the only procurement-based innovation policy that is systematically producing tangible results, albeit at modest expenditure levels ... [Departmental] budgets are focused on delivery and value for money and there is little incentive for officials to get involved in funding innovative technology other than as a component of large scale systems procurements".¹⁶¹ NESTA said that the SBRI "has played a vital role in stimulating innovation in the procurement process ... 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"—although they also suggested that it would "be most effective as part of a comprehensive framework for leveraging demand for innovation to pull new technology to market".¹⁶² Colin Cram similarly acknowledged

¹⁵⁹ PP 41.

¹⁶⁰ Ibid. Proxama has grown from four to 12 people in the last year—which it attributes to the SBRI competition. This has also involved the recent takeover of a Cambridge-based company working in a related technical area.

¹⁶¹ PP 13.

¹⁶² PP 07.

that the work of the SBRI: "it does support some innovation and it is measurable", but also noted that "50% of its support has been for companies supplying to the MoD and 25% to the NHS. I am not sure that this bias was the intention behind the initiative".¹⁶³

127. The current scheme has been in operation for less than two years and, given the long lead times for some of the projects, has yet to be evaluated. Professor Georghiou and Professor Edler, however, called for a rigorous evaluation because "much of the present debate is founded upon anecdote and vignettes." "An important starting point" was, they said, "to address the capacity of the SBRI to affect the UK's innovation performance in terms of its scale. The issue here is that with the most optimistic budget forecasts it will still be a small effort, particularly when compared with the enormous scale of procurement of goods and services".¹⁶⁴
128. In the EU the UK is seen as a leader in implementing the SBRI model and the UK actively participates in EU projects designed to adopt a more strategic approach to innovation (see Appendix 5).

Forward Commitment Procurement

129. The FCP model involves providing the market with advance information on future needs in outcome terms, early engagement with potential suppliers and the incentive of a forward commitment: "an agreement to purchase a product or service that currently may not exist, at a specified future date, providing it can be delivered to agreed performance levels and costs".¹⁶⁵ Initially developed in partnership between DIUS (now BIS) and the OGC to address the particular barriers to market faced by environmental innovations, the approach is also suitable for the procurement of innovative solutions in other markets.¹⁶⁶ BIS told us that it is difficult to estimate the size of the FCP in terms of yearly investment. However, "to date FCP has been operating on a much smaller scale than SBRI with most projects yet to reach the procurement stage. The only completed FCP project is the HM Prison Service procurement of a fully managed Zero Waste Mattress system" (see Box 3 below).¹⁶⁷

BOX 3

Examples of Forward Commitment Procurement

- HM Prison Service used this model in 2007 to procure a mattress and pillow solution that avoided disposal of waste mattresses and pillows into landfill and incineration. HMPS articulated their unmet need and consulted the market to find a solution. The result was innovative new covers that will reduce turnover and a fully recyclable mattress with cost savings estimated to be in the region of £5 million over the life of the contract. In addition, there is an opportunity of adoption across the wider public sector, for example to the NHS.¹⁶⁸

¹⁶³ PP 35.

¹⁶⁴ PP 32.

¹⁶⁵ PP 18.

¹⁶⁶ Ibid.

¹⁶⁷ PP 41.

¹⁶⁸ Ibid.

- Another example which was drawn to our attention is the Ultra Efficient Lighting project, part of a seven year programme of ward reconfiguration by the Rotherham NHS Foundation Trust aimed to procure a highly efficient, smart lighting system that could deliver carbon reduction in a cost effective way and contribute to a pleasant and healthy environment for patients and staff. The solution offers biodynamic lighting¹⁶⁹ with local and intuitive controls with a forecast energy consumption saving of 30% and maintenance savings of 88%. The project is now in the final stages of the procurement process and a demonstration unit will be built at Rotherham hospital in 2011.¹⁷⁰

130. In November 2008, DIUS launched an Innovation for Sustainability Competition with the aim of increasing awareness of FCP across government and launching pilot projects. A number of projects were chosen and are receiving support and advice. Completion of these procurement projects is expected in 2011. The aim of the competition was to develop in-house FCP capability in the private sector.¹⁷¹
131. Johnson Matthey believed that "expanding the use of FCP across the public sector will more effectively stimulate innovation within industry than conventional procurement approaches".¹⁷² The Institution of Engineering and Technology was also positive: "FCP is small in scale but has proved effective. Through FCP, government has created a credible procurement process to develop and buy innovative products and services".¹⁷³
132. Cundall, a multidisciplinary consulting engineering practice, is one of the bidders involved in the Rotherham energy efficiency project (see Box 3). They were enthusiastic about FCP. Through FCP, they said,
- "we were no longer bound by technical specifications that might not deliver what the customer actually wanted, but were free to suggest innovative solutions that could meet this outcome-based requirement ... we clubbed together with other members of the supply chain so that we could offer an optimal and innovative solution ... we believe FCP has been totally revolutionary. Rotherham NHS Trust has been offered a solution that delivers energy savings, carbon savings and a 'step-change' in patient and staff experience."¹⁷⁴
133. **BIS is planning an evaluation of SBRI and FCP in 2012. Professor Georghiou and Professor Edler told us that such an evaluation would be challenging. The Government should ensure this review is robust and takes into account the issues raised by Professor Georghiou and Professor Edler. We look forward to seeing the outcome of the evaluation.**

¹⁶⁹ This is a light that changes in level and colour over the course of the day or night based on scientifically predetermined programs.

¹⁷⁰ PP 15, PP 18.

¹⁷¹ *Forward Commitment Procurement: practical pathways to delivering innovation*, BIS (November 2008).

¹⁷² PP 10.

¹⁷³ PP 24.

¹⁷⁴ PP 11.

CHAPTER 6: LIST OF CONCLUSIONS AND RECOMMENDATIONS

134. Our intention is to follow up this report during the next session (2012–13), in about 12 to 18 months' time, in order to see what progress has been made against the findings of this report and what plans have been put in place to ensure that improvements are set to continue. All our recommendations should be read against this timeline (paragraph 12). (Recommendation 1)
135. It is striking the number of documents and reports published in recent years that make recommendations about innovation in public procurement. Yet it is disappointing that we have seen no evidence of a systematic and coherence use of public procurement as a tool to stimulate innovation. We urge the Government to take steps to ensure that there is a fundamental change in the culture within government so that innovation is wholly integrated into the procurement process (paragraph 26). (Recommendation 2)
136. We recommend that a Minister should be responsible for both procurement and innovation, charged with ensuring that, where appropriate, innovative solutions are used to meet procurement problems across government. The Minister assigned with this responsibility should formulate a national framework for innovation in procurement which will provide the basis on which government departments, local authorities and non-departmental bodies would work. The Minister should be held accountable for how well procurement decisions are made including to what extent innovative solutions had been considered and the reasons why they had not been adopted (paragraph 32). (Recommendation 3)
137. Furthermore, there should be a Minister in each government department with specific responsibility for procurement and innovation in order to create a high level network across government with a view to strengthening the link between public procurement and innovation. (paragraph 33). (Recommendation 4)
138. We recommend that all government departments, including the DfT, should set out in their IPPs measurable objectives against which success can be assessed and a timetable according to which those objectives must be achieved (paragraph 43). (Recommendation 5)
139. We recommend that the DfT should identify the additional activities it intends to carry out to ensure that the possibility of innovative solutions to its procurement problems is systematically included in its procurement decision-making processes (paragraph 50). (Recommendation 6)
140. The examples we have received of the HA's use of procurement of innovative ideas are encouraging and should be used to inform the procurement activities of the DfT and its other agencies. (paragraph 55). (Recommendation 7)
141. Long-term strategic procurement planning needs improvement. In particular, grand challenges, such as adapting to climate change, should be taken into account in public procurement decisions (paragraph 62). (Recommendation 8)
142. The involvement of departmental CSAs is essential if horizon-scanning activities within departments are to be carried out effectively. We recommend that government departments should set out in their IPPs how

these plans support departmental long-term planning and horizon-scanning, over the next several decades (in the case of departments that procure long-lived infrastructure projects, the very long-term planning should be carried out over the life of the infrastructure). Such plans should be formulated in consultation with Foresight and departmental CSAs. The long-term plan should be kept under review and include technology roadmaps and measures against which the appropriateness and effectiveness of the plan can be assessed (paragraph 63). (Recommendation 9)

143. The Government's capacity to act as an "intelligent customer" is limited by the level of procurement skills and knowledge in departments and the absence of incentives to procure innovative solutions. Providing training courses is not good enough. Departments need to recruit procurement staff with demonstrable expertise and experience. We invite the Government to set out what further steps they intend to take to bring about a marked change in their capacity to act as an "intelligent customer" (paragraph 73). (Recommendation 10)
144. Ministers recognise that risk aversion inhibits both the commissioning, and offering, of innovative solutions, but it is not clear how this recognition is being translated into action. The Government should identify what steps they will take:
 - (a) to offset risk aversion within government departments;
 - (b) to make provision to ensure that the balance between risks and rewards in procurement contracts is properly managed and shared to encourage innovation where it is warranted (for example having an element of the procurement budget set aside for innovation); and
 - (c) to set out how they intend to demonstrate the success of this policy and the timeframe in which they anticipate achieving that success (paragraph 82). (Recommendation 11)
145. We recommend that CSAs should have responsibility for encouraging engagement with industry (including both suppliers and potential suppliers) and academic communities with a view to promoting the procurement of innovative solutions. In particular, CSAs should ensure that mechanisms are in place to develop a stronger connection between the department and the science base so that procurement officials are better informed about the availability of innovative ideas. This role should be incorporated into departmental objectives (paragraph 87). (Recommendation 12)
146. On the basis of the evidence which we have received, we recommend that departments, through the CSA, should either:
 - set up a mechanism similar to the MoD's Centre for Defence Enterprise or the NHS National Innovation Centre, to encourage the submission of proactive unsolicited proposals from industry or academia; or
 - ask the TSB to play a more active role in such activities within their departments (paragraph 88). (Recommendation 13)
147. We note that the ERG is charged with simplifying the procurement process and we welcome this development. We invite the Government to explain when this simplification will be achieved, by what criteria they will judge its effectiveness and whether it will impact, by example, other areas of public sector procurement (paragraph 94).

148. The Government's *laissez faire* approach to the dissemination of best practice in procurement from central to local government appears to be overly optimistic. We recommend that the Government should put in place a system whereby examples of procurement of innovative solutions can be shared across central and local government. The Government should set out what steps, and when, they will take to implement a system of dissemination and indicate how they will assess its effectiveness (paragraph 100). (Recommendation 14)
149. We welcome the Government's recognition that efficiency and innovation can be complementary and that this message should be communicated throughout the public sector, including local government. Getting this message across is part of the wider issue of a need for a root and branch cultural change in attitude towards adopting innovative solutions to which we have already referred in this report (paragraph 104).
150. SMEs and large companies both have a role in developing innovative solutions. However, given the conflicting evidence about the contribution of SMEs in promoting innovation, we invite the Government to explain their current policy on SMEs, particularly the aspiration that 25% of government contracts should be awarded to SMEs (paragraph 112).
151. The Government should set out what support they are giving to SMEs acting as sub-contractors, and what they are doing to improve contract management across the supply-chain to encourage innovation (paragraph 188). (Recommendation 15)
152. The TSB has an important role in innovation and that role is about to be expanded. We invite the Government to explain how the TSB will discharge its extra responsibilities within current resources and also what steps they will take to ensure that the work of the TSB is used by government departments to improve their capabilities for innovation procurement. (paragraph 123).
153. BIS is planning an evaluation of SBRI and FCP in 2012. Professor Georghiou and Professor Edler told us that such an evaluation would be challenging. The Government should ensure this review is robust and takes into account the issues raised by Professor Georghiou and Professor Edler. We look forward to seeing the outcome of the evaluation (paragraph 133). (Recommendation 16)

APPENDIX 1: MEMBERS AND DECLARATIONS OF INTEREST

Members:

Lord Broers
 Lord Crickhowell
 Lord Cunningham of Felling
 Baroness Hilton of Eggardon
 Lord Krebs (Chairman)
 Baroness Neuberger
 Lord Patel
 Baroness Perry of Southwark
 Lord Rees of Ludlow
 Earl of Selborne
 Lord Wade of Chorlton
 Lord Warner
 Lord Willis of Knaresborough
 Lord Winston

Specialist Adviser:

Dr Paul Nightingale, Senior Research Fellow, Deputy Director, SPRU, University of Sussex

Declared Interests:

Lord Broers
Chairman of the Board of the Diamond Light Source
Chairman of Bio Nano Consulting Ltd
Chairman TSB Knowledge Transfer Network for Transport
 Lord Crickhowell
None
 Lord Cunningham of Felling
None
 Baroness Hilton of Eggardon
None
 Lord Krebs
Principal Jesus College, Oxford
Chair of Royal Society Science Policy Advisory Group
Chairman, Oxford Risk Ltd
 Baroness Neuberger
Chair, Responsible Gambling Strategy Board
Chair, the Responsible Gambling Fund
 Lord Patel
Member Council, Medical Research Council
Chancellor, University of Dundee
Fellow, Royal Society Edinburgh
Medical Doctor
 Baroness Perry of Southwark
None
 Lord Rees of Ludlow
None

Earl of Selborne

None

Lord Wade of Chorlton

Director, M and M Funds Plc (Fund Management)

Director, Rocktrom Ltd (Innovative Recycling Technology)

Lord Warner

None

Lord Willis of Knaresborough

None

Lord Winston

Faculty member, Imperial College London

Member Engineering and Physical Sciences Research Council

Fellow, Royal Academy of Engineering

Fellow, Academy of Medical Sciences

Member, Scottish Scientific Advisory Committee

Director, Atazoa Ltd; a biotech company

A full list of Members' interests can be found in the Register of Lords Interests:

<http://www.parliament.uk/mps-lords-and-offices/standards-and-interests/register-of-lords-interests>

Dr Paul Nightingale, Specialist Adviser

Recipient of funding from NESTA, BIS and TSB for previous and ongoing research

APPENDIX 2: LIST OF WITNESSES

Evidence is published online at www.parliament.uk/hlscience and available for inspection at the Parliamentary Archives (020 7219 5314).

Oral Evidence

Q 1–34

Mr Fergus Harradence, Department for Business, Innovation and Skills (BIS), Ms Sally Collier, Cabinet Office, Mr Mike Acheson, Department for Transport, and Ms Ginny Clarke, Highways

Q 35–51

Professor Luke Georghiou, University of Manchester; Professor Jakob Edler, University of Manchester; and David Connell, University of Cambridge

Q 52–83

Mr Stian Westlake, NESTA, Mr Iain Gray, Technology Strategy Board and Brian Collins, Chief Scientific Adviser (DfT and BIS)

Q 84–104

Lord Sainsbury of Turville

Q 105–146

Colin Cram, Marcl Ltd; Andrew Wolstenholme, Balfour Beatty; and Alan Powderham, Mott MacDonald

Q 147–175

Mr Collan Murray, Mr Andrew Quincey and Mr Martin Rowark, Transport for London

Q 176–196

David Willetts, Minister of State for Universities and Science, Department for Business, Innovation and Skills; Francis Maude, Minister for the Cabinet Office; and Mike Penning, Parliamentary Under-Secretary of State, Department for Transport.

Written Evidence

Evidence received by the Committee is listed below in order of receipt and in alphabetical order. Witnesses marked with * also gave oral evidence. Witnesses marked with ** gave oral evidence and did not submit any written evidence.

Written Evidence in Numerical Order

(PP 1)	Mr Charles Wessner, US National Academy of Sciences
(PP 2)	Professor Lord Bhattacharyya
(PP 3)	Juice Technology Limited
(PP 4)	Professor Chris Hendry
(PP 5)	Birmingham Science City
(PP 6)	Transport Research Laboratory (TRL)
* (PP 7)	NESTA

- (PP 8) Prof Lewis M Branscomb
- (PP 9) East of England Strategic Health Authority
- (PP 10) Johnson Matthey Fuel Cells Ltd
- (PP 11) Cundall Johnston & Partners LLP
- (PP 12) Association of Independent Research and Technology Organisations Ltd (AIRTO)
- * (PP 13) Mr David Connell
- (PP 14) Happold Consulting Ltd
- (PP 15) Rotherham NHS Foundation Trust
- * (PP 16) Professor Luke Georghiou, Professor Jakob Edler and Dr Elvira Uyarra
- (PP 17) Intelligent Transport Society for the United Kingdom (ITS UK)
- * (PP 18) Department for Business, Innovation and Skills (BIS)
- (PP 19) Intellect
- (PP 20) Olswang LLP
- * (PP 21) Technology Strategy Board (TSB)
- (PP 22) Mr Charles Penny
- (PP 23) Campaign for Science and Engineering
- (PP 24) Institution of Engineering and Technology (IET)
- * (PP 25) Transport for London (TfL)
- (PP 26) Invensys Rail
- (PP 27) Ministry of Defence
- (PP 28) Mr R Mayer
- (PP 29) Design Council
- * (PP 30) Mr Alan Powderham, Mott MacDonald
- * (PP 31) Mr Colin Cram, Marc 1 Ltd
- * (PP 32) Professor Luke Georghiou and Professor Jakob Edler supplementary evidence
- * (PP 33) Department for Business, Innovation and Skills supplementary evidence (BIS)
- * (PP 34) Mr Andrew Wolstenholme, Balfour Beatty supplementary evidence
- * (PP 35, 36) Mr Colin Cram, Marc 1 Ltd supplementary evidence
- * (PP 37) Department for Business, Innovation and Skills further supplementary evidence (BIS)
- * (PP 38) Mr David Connell supplementary evidence
- * (PP 39, 40) Transport for London (TfL) supplementary evidence
- * (PP 41) Department for Business, Innovation and Skills (BIS) further supplementary evidence

Written Evidence in Alphabetical Order

- Association of Independent Research and Technology Organisations Ltd (AIRTO) (PP 12)
- Professor Lord Bhattacharyya (PP 2)
- Birmingham Science City (PP 5)
- * Department for Business, Innovation and Skills (PP 18, PP 33, PP 37, PP 41)
- Professor Lewis M Branscomb (PP 8)
- Campaign for Science and Engineering (PP 23)
- * Mr David Connell (PP13, PP38)
- * Mr Colin Cram, Marc 1 Ltd (PP 31, PP 35, PP 36)
- Cundall Johnston & Partners LLP (PP 11)
- Design Council (PP 29)
- East of England Strategic Health Authority (PP 09)
- * Professor Luke Georghiou, Professor Jakob Edler and Dr Elvira Uyarra (PP 16, PP 32)
- Happold Consulting Ltd (PP 14)
- Professor Chris Hendry (PP 4)
- Institution of Engineering and Technology (IET) (PP 24)
- Intellect (PP 19)
- Intelligent Transport Society for the United Kingdom (ITS UK) (PP 17)
- Invensys Rail (PP 26)
- Johnson Matthey Fuel Cells Ltd (PP 10)
- Juice Technology Limited (PP 3)
- Mr R Mayer (PP 28)
- Ministry of Defence (PP 27)
- * NESTA (PP 7)
- Olswang LLP (PP 20)
- Mr Charles Penny (PP 22)
- * Mr Alan Powderham, Mott MacDonald (PP 30)
- Rotherham NHS Foundation Trust (PP 15)
- ** Lord Sainsbury of Turville
- * Technology Strategy Board (TSB) (PP 21)
- * Transport for London (TfL) (PP25, PP39, PP40)
- Transport Research Laboratory (TRL) (PP 6)
- Mr Charles Wessner, US National Academy of Sciences (PP 1)
- * Mr Andrew Wolstenholme, Balfour Beatty (PP 34)

APPENDIX 3: CALL FOR EVIDENCE

The House of Lords Science and Technology Select Committee, under the chairmanship of Lord Krebs, is conducting an inquiry into the Government's use of procurement as a tool to stimulate innovation within industry. The inquiry will focus in particular on the Department for Transport and its related public bodies, as a working example of the current procurement practices within departments. However relevant evidence is welcomed on examples of procurement practices from other departments, and on the overarching role of procurement as a tool to stimulate innovation.

Scope

The inquiry seeks to investigate the extent to which the current procurement practices and processes in place are effective in encouraging innovation within industry and supporting the development and diffusion of innovations. It will focus on:

1. The role of public procurement as a tool for stimulating commercially valuable innovation within industry
2. The success or failure of current public procurement processes, mechanisms and tools in stimulating innovation within industry
3. Potential mechanisms and processes for stimulating innovation in industry through public procurement, and any relevant comparisons overseas
4. The impact of departmental and other government structures, processes and cultures on the use of procurement as an innovation tool, and cross-government and departmental efforts to co-ordinate and reconcile conflicts between policy objectives.

The inquiry will **not** cover innovation in the procurement process, such as e-procurement.

Questions:

The Committee invite submissions on the following points:

Rationale

1. What is the rationale for using public procurement as an innovation tool to stimulate innovation within the industries on which government relies? And what evidence is there to support its use as an innovation tool?

Co-ordination of innovation and procurement policies

2. To what extent are strategic departmental and cross-government policy objectives meshed with procurement and innovation policies and how might this be improved? What cross-government mechanisms and co-ordination is in place to help to facilitate this?

Mechanisms through which government procurement can stimulate innovation

3. What public procurement mechanisms are currently used to stimulate innovation within industry? How successful are they? How is the success of such measures evaluated?
4. How might public procurement more effectively stimulate innovation within industry?

5. What lessons can we learn from successes and failures within the procurement processes of other countries to stimulate innovation within industry?

The procurement process

6. What incentive do those working within public sector organisations have to use procurement as an approach to stimulating innovation?

7. To what extent are those responsible for public procurement of research and development “intelligent customers”?

- Do they have the appropriate expertise to identify innovative solutions to procurement needs?
- How well do they identify when innovation could provide a solution to a procurement need?
- How effective is the identification of and dialogue with appropriate potential suppliers?

8. What obstacles do those responsible for procurement within public sector organisations face in encouraging innovation through their procurement strategies? How might these be tackled?

9. What obstacles do potential suppliers of innovative solutions face in responding to public procurement requirements? How might these be tackled?

The Committee would also be interested to hear about any other issues not already covered by this call for evidence that are relevant to the scope of the inquiry.

APPENDIX 4: SEMINAR HELD AT THE HOUSE OF LORDS

14 December 2010

Members of the Committee present were Lord Broers, Lord Crickhowell, Lord Cunningham of Felling, Baroness Hilton of Eggardon, Lord Krebs (Chairman), Baroness Neuberger, Lord Patel, Baroness Perry of Southwark, Lord Rees of Ludlow, Earl of Selborne, Lord Wade of Chorlton, Lord Willis of Knaresborough and Lord Winston.

Presentations were heard from:

- Dr Paul Nightingale (Deputy Director, Science and Technology Policy Research (SPRU) and Specialist Adviser to the Committee): An overview of the use of public procurement as an innovation tool in the United Kingdom and internationally.
- Sally Collier (Director, Procurement Policy and Capability, Cabinet Office): An overview of the general procurement process within Government, including the role of the Cabinet Office, the role of the Departments in procurement and cross-Government co-ordination of public procurement activities.
- Fergus Harradence (Deputy Director, Innovation Policy, BIS): The use of public procurement as an innovation tool within Government, including public procurement as an innovation tool in the United Kingdom and how stimulating innovation within industry fits into the procurement process and other policy processes.
- Mike Acheson (Deputy Director of Corporate Procurement, DfT): An overview of public procurement within the transport sector and the use of public procurement to stimulate innovation within industry, including the public procurement landscape and key players within the Department for Transport and its agencies and examples of procurement activities within the Department designed to stimulate innovation within industry.

APPENDIX 5: INTERNATIONAL USE OF PUBLIC PROCUREMENT AS AN INNOVATION POLICY TOOL

In this appendix we summarise the evidence received on what lessons can we learned from how other countries use public procurement as a tool to stimulate innovation.

Europe

In recent times the EU has placed innovation at the heart of their policy with a view of maintaining the EU's competitiveness on the global market. The EU has a target of increasing spend on R&D from 0.8% of GDP to 3% of GDP by 2020 which "could create 3.7 million jobs and increase annual GDP by Euro 795 billion by 2025."¹⁷⁵

The recent EU communication Innovation Union aims to "improve conditions and access to finance for research and innovation in Europe, to ensure that innovative ideas can be turned into products and services that create growth and jobs." One strand of specific activities revolves around the strategic use of individual governments' procurement budgets to finance procurement of innovative products and services. The Communication also introduces an innovation scoreboard based on 25 key indicators.¹⁷⁶ Another area of work is the ongoing evaluation of current EU directives to possibly introduce legislation to make cross border joint procurements easier to counter the current public procurement fragmentation landscape.¹⁷⁷

The UK is a member of the PRO-INNO project which is looking to develop an SBRI-type programme for the EU. In Europe the UK is considered a leader in implementing the SBRI model which the European Commission calls pre-commercial procurement.¹⁷⁸

Other projects include the Lead Markets Initiative which aims to reduce the carbon emissions and energy requirements of healthcare buildings; and the SCI-network project, "a network to share experience across the EU on procurement of innovative sustainable construction."¹⁷⁹

Individual countries within the EU "claim to implement demand based strategies; none actually have systematic evidence of their impact yet."¹⁸⁰ One example of a "true lead market through procurement" is a data exchange system developed in Estonia that allows government databases to communicate with each other. The technology has been exported to other countries.¹⁸¹

USA

For years the USA has been considered as the example to follow with regards to R&D-based solutions to the public sector. Their SBIR scheme has been running for 28 years and issues around \$2 billion worth of contracts annually and since its

¹⁷⁵ *Innovation Union*, Europe 2020 Flagship Initiative, SEC(2010) 1161 (October 2010)

¹⁷⁶ <http://ec.europa.eu/research/innovation-union>.

¹⁷⁷ PP24.

¹⁷⁸ PP21.

¹⁷⁹ PP18.

¹⁸⁰ PP16.

¹⁸¹ Q40.

inception the programme "has involved more than 15,000 firms, developed more than \$21 billion worth of research and over 45,000 patents."¹⁸² These figures are very impressive. However, peer reviewed academic evaluations pointed out that the finance provided by government was often only a replacement for the private investment in R&D to which companies were already committed.¹⁸³

The Defense Advanced Research Projects Agency (DARPA) is an agency of the US tasked with developing new technology for the US military. DARPA is seen as "very successful in the use of 'demonstrators' and 'grand challenges' in driving innovation through procurement."¹⁸⁴

Other countries

An often-quoted example of good government coordination in stimulating innovation is Singapore. This country committed itself to "being a global hub for computer storage—and took the measures to train people, build up a research capability, and provided attractive inward investment terms in this technology. Over 40% of global mass storage technology, and over 70% for high-end computing storage, comes out of Singapore as a consequence."¹⁸⁵

¹⁸² PP21.

¹⁸³ *The effects of Government-Industry R&D programmes on Private R&D: The case of the Small Business Innovation Research Programme*. Wallsten, SJ., The RAND Journal of Economics (2000)

¹⁸⁴ PP02.

¹⁸⁵ Ibid.

APPENDIX 6: ABBREVIATIONS AND ACRONYMS

AIRTO	Association of Independent Research and Technology Organisations
BIS	Department of Business, Innovation and Skills
CO	Cabinet Office
CSA	Chief Scientific Adviser
DARPA	Defence Advanced Research Projects Agency
Defra	Department for environment, food and rural affairs
DfT	Department for Transport
DIUS	Department for Innovation, Universities and Skills (now BIS)
DPW	Department for Work and Pensions
EMAC	Enhanced Managing Agent Contractor
ERG	Efficiency and Reform Group
FCP	Forward Commitment Procurement
HA	Highways Agency
IPP	Innovation Procurement Plan
KTNs	Knowledge Transfer Networks
KTPs	Knowledge Transfer Partnerships
MoD	Ministry of Defence
NAO	National Audit Office
NESTA	National Endowment for Science Technology and the Arts
OFT	Office of Fair Trading
OGC	Office of Government Commerce
R&D	Research and development
RDAs	Regional Development Agencies
SBRI	Small Business Research Initiative
SMEs	Small and Medium-size enterprises
TfL	Transport for London
TSB	Technology Strategy Board

APPENDIX 7: RECENT REPORTS FROM THE HOUSE OF LORDS SCIENCE AND TECHNOLOGY COMMITTEE

Session 2006–07

- 1st Report Ageing: Scientific Aspects—Second Follow-up
- 2nd Report Water Management: Follow-up
- 3rd Report Annual Report for 2006
- 4th Report Radioactive Waste Management: an Update
- 5th Report Personal Internet Security
- 6th Report Allergy
- 7th Report Science Teaching in Schools: Follow-up
- 8th Report Science and Heritage: an Update

Session 2007–08

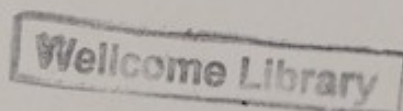
- 1st Report Air Travel and Health: an Update
- 2nd Report Radioactive Waste Management Update: Government Response
- 3rd Report Air Travel and Health Update: Government Response
- 4th Report Personal Internet Security: Follow-up
- 5th Report Systematics and Taxonomy: Follow-up
- 6th Report Waste Reduction
- 7th Report Waste Reduction: Government Response

Session 2008–09

- 1st Report Systematics and Taxonomy Follow-up: Government Response
- 2nd Report Genomic Medicine
- 3rd Report Pandemic Influenza: Follow-up

Session 2009–10

- 1st Report Nanotechnologies and Food
- 2nd Report Radioactive Waste Management: a further update
- 3rd Report Setting priorities for publicly funded research





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