Technology Strategy Board
Driving Innovation

Technology-inspired innovation

COMPETITION FOR COLLABORATIVE R&D FUNDING
OCTOBER 2011

Scottish Enterprise

Technology-inspired innovation

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Summary

The Technology Strategy Board is to invest up to £15m in collaborative research and development projects that stimulate innovation across our key enabling technology areas – advanced materials; biosciences; electronics, photonics and electrical systems; information and communications technology; and nanoscale technologies. This competition is co-funded by Scottish Enterprise with up to £2.75m of additional funding.

Our focus is on projects where recent technological discoveries or breakthroughs have inspired people to innovate in a context of significant technology risk, or have led to ideas that are yet to find applications in a recognised market or business sector.

Innovation in these key enabling technology areas can be a significant driver of economic growth and enhance quality of life.

Proposals should be collaborative and led by a business. We expect to invest between £250k and £500k in each project, although projects outside this range will be considered. We are primarily looking to fund applied research projects attracting 50% public funding.

This is a two-stage competition. It opens on **31 October 2011** and the deadline for registration is at noon on **30 November, 2011**. The second stage for invited applicants opens on **6 February 2011** and the deadline for completed applications is at noon on **21 March 2011**. A briefing event will be held in London on **10 November 2011**.

Note: For further information on Scottish Enterprise priorities for this competition, please refer to **www.scottish-enterprise.com/your-sector/technology**

Background

The Technology Strategy Board aims to support business-orientated innovation across a broad range of technologies that fall within the five key areas of advanced materials; biosciences; electronics, photonics and electrical systems; information and communications technology; and nanoscale technologies.

These key enabling technologies often underpin successful innovations and each can have an impact across several market sectors. They can lead to the development of new products and processes and can be a significant driver of economic growth. They will keep the UK at the forefront of modern technology and enhance quality of life.

Together, these technologies underpin a large part of the UK economy. Businesses in the UK that produce, process, fabricate and recycle materials have an annual turnover of around £170bn alone. They contribute about 15% of UK GDP and have a gross value-added (GVA) of around £60bn.

This competition is designed to stimulate projects inspired by new discoveries and breakthroughs, including ideas that are yet to find applications in a recognised market or business sector.

This open competition welcomes new proposals for collaboration as well as those from applicants from our previous 'Technology-inspired feasibility studies' competition where a collaborative approach is now required to take ideas forward. For details of previous feasibility studies go to **www.innovateuk.org** and search for feasibility studies.

Participation in the 'Technology-Inspired feasibility studies' competition is not a pre-requisite for participation in this competition.

Scope

The technological scope of this competition is aligned with that of the core enabling technologies outlined in our strategy *Concept to Commercialisation* (see **www.innovateuk.org** under publications).

All projects must contain a significant element of enabling technology innovation. This competition will focus on projects where recent technological discoveries or breakthroughs have inspired people to innovate in a context of significant technology risk, demanding highly skilled, multidisciplinary resources, working in a collaborative project team.

We are especially keen to encourage innovation in new enabling technologies that have the potential to span different disciplines and may not be directly driven by society's challenges. An example is innovations that lead to new technology platforms, or 'springboards', from which the potential commercial benefits could be realised across multiple applications. The scope includes taking a known technology into new application areas where significant technical challenges are made clear and need to be overcome.

Projects will generally be at the applied research stage leading to (and possibly including some work packages of) experimental development. We expect most projects to be starting from around the 'proof of concept' maturity level and be developing towards 'demonstrator' level.

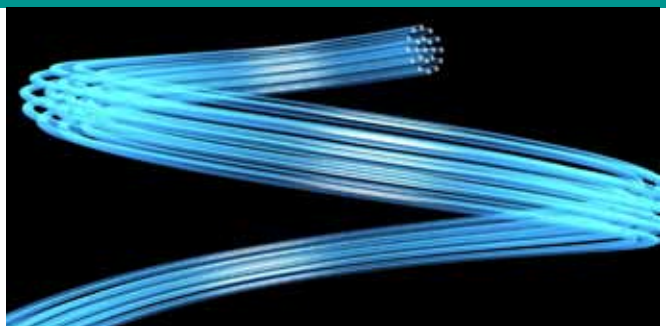
Some work packages of industry orientated basic research may be supported, provided they are clearly shown to be an essential part but not the main focus of the innovation project.

The projects need to align with one or more of the technology areas below. Where a proposal cuts across more than one technology area, the application should indicate the predominant area of innovation.

Advanced materials

Advanced materials is a multidisciplinary technology platform, with many crossovers into other technical areas and with the potential to address challenges across a broad range of applications.

Advanced materials are defined in our strategy as materials, and their associated process technologies, with the potential to be exploited in high-value products or processes via multiple strong UK market sectors. We are seeking innovations within four broad main categories – structural materials, functional materials, multifunctional materials and biomaterials – together with supporting cross-cutting areas including, but not limited to, nanomaterials (see later section), modelling, design, metrology and standards, process technologies and materials manufacturing



(as defined in the Technology Strategy Board's *Advanced Materials Key Technology Area 2008-2011*, see **www.innovateuk.org** under publications).

We recognise the need for continued investment in underpinning and emerging generic materials technology development. Areas for potential investigation include:

- lightweight materials and structures, including composites and hybrids
- materials to withstand aggressive environments (for example high temperature, corrosive, erosive)
- electronic, magnetic and optical functional materials and metamaterials
- smart and multifunctional materials, devices and structures
- surface engineering and coating technologies
- particulate engineering
- fibre and textile-based technologies
- bioresorbable, bioactive and biocompatible materials
- natural and bio-based materials
- joining technologies
- materials with reduced environmental impact through life
- non-destructive evaluation of materials/ structural health monitoring/condition monitoring
- predictive modelling through the full life cycle, including lifetime prediction.

Biosciences

Bioscience technologies have a role in the development of products in areas as diverse as healthcare and medicine, agriculture, energy, food and personal care. We are specifically encouraging proposals that are biologically inspired and where the resultant technologies will enable multiple applications or the development of a variety of products. These include:

- 'omics
  - development of novel tools and techniques to better access, understand and enable the exploitation of genomic, transcriptomic, proteomic and metabolomic information
  - novel technologies or approaches to gather, organise, filter and interpret biological data including bioinformatics, biological system modelling and data visualisation
  - development of technologies or approaches to derive value from the UK's publicly held culture collections or biobanks
- industrial and medical biotechnology
  - novel technologies or approaches to enable improvements in discovery, characterisation and bioprocessing
  - upstream technologies for the effective processing of sustainable raw materials or feedstocks into high-value products
  - downstream technologies to increase recovery and ensure quality
  - technologies to enhance the complex formulation of biologically-derived products
- agriculture and food
  - technologies or approaches to enable the identification of new, or to increase the yields of existing, renewable feedstocks
  - novel or improved cell, reproductive, propagation or cryopreservation technologies
  - novel technologies, platforms and processes enabling the development of food and drink products and ingredients
  - development of diagnostic and monitoring technologies with application across the food supply chain.

Note: Industrial biotechnology for the production of chemicals is out of scope for this competition.

Electronics, Photonics and Electrical Systems

Included in scope are:

- control systems and power engineering – reducing electricity consumption in the built environment, industrial processes or transport including lighting, photovoltaics, power conversion and management
- plastics and printed electronics – developing and stimulating the technology and business relationships within the UK plastic electronics community, building the supply chain and removing barriers to industrialisation
- communications – contributing to the cost-effective development and deployment of next-generation access, or the development of local high-frequency wireless networks
- data and image acquisition – developing systems based on sensing and imaging capabilities including location-sensing, location services and synchronisation, item-tracking, sensors and sensor networks
- systems design and integration – embedded systems, robotics and autonomous systems, and verification and testing of computing system designs including industrial lasers.

Information and communications technology

ICT cuts across many other areas. We will consider radically new software-based technologies or approaches to enable:

- reliable and continuous sensing in challenging physical environments
- intelligent, autonomous or autonomic machine reasoning and behaviour
- computers to take account of user requirements, preferences, values and processes
- complex ICT systems to be engineered rapidly, cost-effectively and reliably to be fit-for-purpose, ie safe, secure and resilient.

Nanotechnology

Nanoscale technologies are beginning to be applied to almost all market sectors. They are typified not just by scale alone, but what the added functionality is at that scale. We are looking for new technologies that can address one or more of four key areas:

- new materials – exploiting the functionality/multifunctionality and novel

effects that can be found at nanoscale through new materials' development

- new manufacturing – exploiting new manufacturing technologies through new and converging top-down and bottom-up approaches, and tackling the associated challenges, for example scaling up to industrially relevant volumes and removing agglomeration through new formulation techniques
- new metrology – enhanced measurement and characterisation methods for nanoscale materials, for example new imaging or nanoscale spectroscopy instrumentation including for detection in air, soil, water or other media and novel approaches to measurement, monitoring and control of exposure to nanoscale materials in the workplace or environment
- integration – integrating functionality at nanoscale into new devices and structures to exploit the value from incorporating nanoscale materials and effects.

Proposals in this area, especially those related to the application of nanoscale materials, should consider responsible development initiatives to safeguard against any potential risks or harm to people and/or the environment.

We encourage consortia to develop proposals that focus on key aspects of supply-chain working, from materials supply to systems integrator to end-user, and on the potential for developing technologies and platforms that can address multiple markets.

Funding allocation and application process

The Technology Strategy Board has allocated up to £15m to fund collaborative research and development projects that address the technical challenges and inspire and demonstrate new technologies that align with the scope described above. This competition is co-funded by Scottish Enterprise with up to £2.75m of additional funding.

Looking for partners to work on your project? Go to **_connect** (**www.innovateuk.org/connect**) to find collaborators and networks.

We are primarily looking to fund applied research projects attracting 50% public funding. We expect to invest between £250k and £500k in each project, although projects outside this range will be considered.

Projects should deliver a tangible outcome such as a system or process demonstrator. They will normally last two to three years, although we will consider projects either side of this timescale. ICT projects may be shorter depending upon their nature.

Projects must be collaborative and can involve science-to-business or business-to-business interactions. Projects must be business-led, therefore academics can apply only as a partner in a consortium.

All applications will be assessed on individual merit in accordance with the normal Technology Strategy Board process. However, in order to ensure coverage of the whole technology scope, we reserve the right to apply a 'portfolio' approach across the five technology areas, subject to applications meeting the required quality threshold.

This is a two-stage competition that will open on **31 October 2011.** The deadline for registration is at noon on **30 November 2011** and for expressions of interest (EOI) at noon on **7 December 2011**. The second stage for invited applications will open on **6 February 2011** and close at noon on **21 March 2011**.

An optional briefing will be held in London on **10 November 2011** to highlight the main features of the competition and explain the application process.

Further details can be found in the *Guidance for Applicants* for this competition, available from our website (see **www.innovateuk.org** under Competitions) after you have registered for this competition.

If you have any queries about the technical scope of the competition or the application process, please contact the Competitions helpline on 0300 321 4357 or email competitions@innovateuk.org

Note that ALL deadlines are at noon.

Key dates

Competition opens	**31 October 2011**
Briefing day	**10 November 2011**
Registration deadline	**30 November 2011 noon**
Expressions of interest (EoI) deadline	**7 December 2011 noon**
EoI applicants informed	**26 January 2012**
Stage 2 opens (for invited applications)	**6 February 2012**
Competition close	**21 March 2012 noon**
Full-stage applicants informed	**1 May 2012**
Feedback provided to applicants	**1 June 2012**

Further information

To apply for this competition you must first register with us. You can do this by going to our web page for this competition at **www.innovateuk.org** under Competitions. When you register you will get access to all the supporting information you need to read before you apply, including the *Guidance for Applicants* and the application form.

Competition helpline: 0300 321 4357

Email: competitions@innovateuk.org

Publicity

The Technology Strategy Board frequently publicises the results of competitions and this includes engagement with the media. Applicants will be asked to provide an agreed form of words for use in publicity material. E-mail pressoffice@tsb.gov.uk with any queries.

The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve quality of life.

Collaborative research and development is part of the Government's Solutions for Business portfolio.

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