

Technology Strategy Board

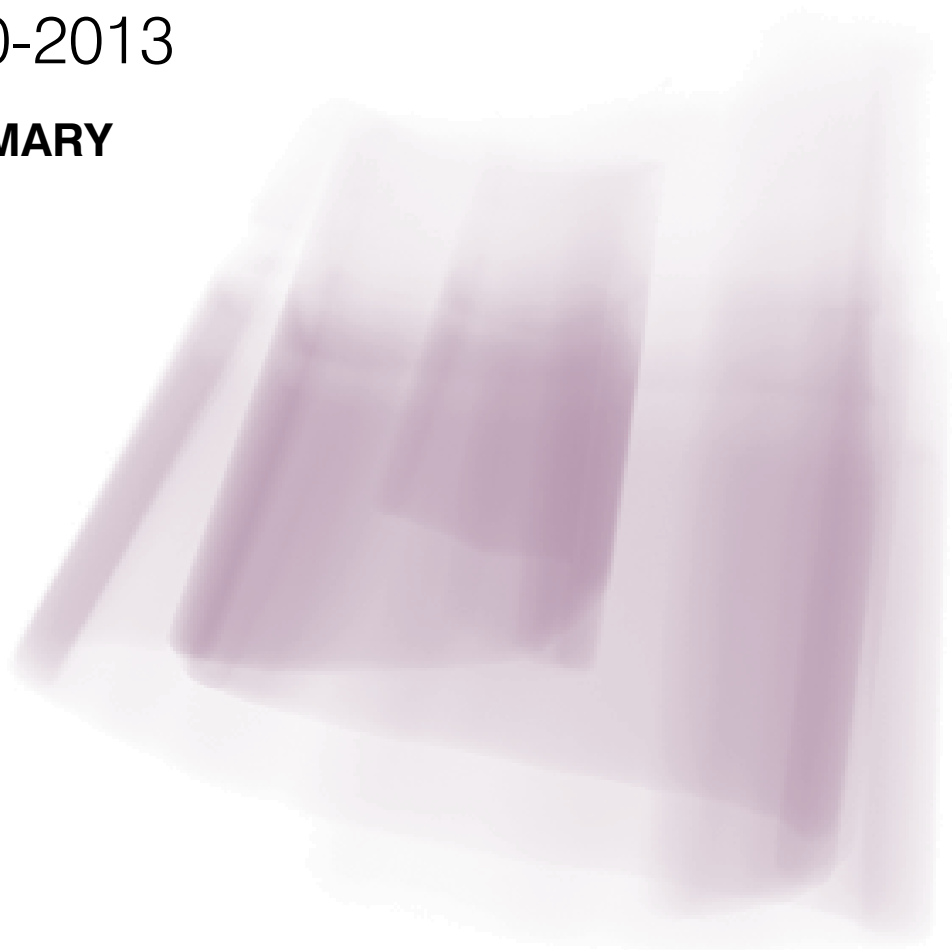
Driving Innovation



Emerging Technologies and Industries

Strategy 2010-2013

EXECUTIVE SUMMARY



Executive summary

This executive summary is an updated version of the *Emerging Technologies Strategy Executive Summary* published in October 2009 (T09/087). Changes have been made to better articulate the ambition of this programme – to help create entirely new UK industries from emerging technologies.

The Government has assigned us the role of promoting the rapid and successful commercialisation of emerging technologies in the UK. Creating wealth from new technologies is recognised as being difficult and risky, and for this reason we are taking a new strategic approach.

This document outlines our strategy for emerging technologies in the UK, and the role of the Technology Strategy Board and our partner organisations to promote their rapid commercial exploitation. It builds on our earlier Interim Strategic Assessment consultation document of October 2008.

What are emerging technologies?

By 'emerging technologies' we mean those technologies that are still emerging from the science base, that are at an early, pre-commercial stage, and that have the potential to enable innovations that will truly disrupt the marketplace. The digital camera and PET medical imaging systems are good examples of such innovations. Emerging technologies:

- enable something to be done that was previously not possible, or was possible only in theory
- lead to new products and services
- may be adopted by existing industries or may result in new industries, and
- may arise from:
 - a major scientific breakthrough, like radar or the transistor
 - the integration of several technologies, like the 5.25 inch disk drive, or
 - a single advance that enables a much bigger innovation, such as switching circuits for mobile phones.

The technologies within the scope of this strategy could be as much as 7-15 years from market, and we will only invest in those where there is evidence that the UK can compete. This strategy provides support from the first technical demonstration to the early stages of commercialisation, in terms of lead application development and early market adoption.

This work forms part of the 'technology-inspired' element of our overall strategy for business innovation in the UK, outlined in our 2008 *Connect and Catalyse* corporate strategy.

Exploiting emerging technologies

We aim to help turn the emerging technologies of today into the growth sectors of tomorrow for UK business. We will work with our partners to develop some of these new and exciting technologies into new industries or into completely new markets for existing industries in the UK. In 10 years' time we want to see the UK poised to lead the world in a major new growth sector that is comparable in size and impact with mobile phones, digital cameras and internet searching. In the process we wish to strengthen considerably the UK's capability and reputation for successfully commercialising new technology.

In developing this strategy we have reviewed the literature in the area and consulted widely with key players including business, academia, technology transfer organisations, the investment community, government departments, the Intellectual Property Office, the research councils, the regional development agencies, the devolved administrations and UK Trade and Investment. The strategy is therefore based on the best available understanding of the landscape in the UK and the best thinking on the ways to promote the early commercialisation of new technologies.

Key issues

Much has improved in the last few years in the UK in terms of technology transfer and exploiting research investment. However, we believe that more can be done to promote and accelerate commercialisation. We have identified the following issues that limit the pace and scope of early commercialisation of emerging technologies:

- finding the best route to market for disruptive ideas is inherently difficult
- there is insufficient support for early-stage, pre-investment, proof-of-concept work (a rate-limiting step for technology demonstration and commercial development)
- existing support is not aligned across the various agencies so investment is not focused on the technologies that have the greatest national potential
- an equity gap particularly affects new entrants (start-up and spin-out companies) that typically spearhead the difficult early stages of commercialisation
- the skills required are in short supply and they change during the commercialisation process.

Our strategy

Our strategy addresses these issues within the context of our role of promoting the rapid and successful commercialisation of emerging technologies, and within the approach of 'connect and catalyse'. It is designed to help accelerate the early stages of technology demonstration and commercialisation, and from there to lay the foundation of new industries for the UK. It recognises that commercialising this type of technology can be a lengthy, high risk and complex process, and that it straddles the interface between business and the science base.

Commercialisation is also costly and despite our undoubted strengths the UK



will not be able to compete successfully in every area. At some point we will have to choose which areas to support.

Our overall approach is therefore to catalyse the emergence and commercial application of more new technologies, and to connect all the key agencies involved to focus support on those technologies that have the greatest potential to create value in the UK.

The strategy and associated activities are designed to fit with our later-stage support such as knowledge transfer networks and collaborative research and development schemes, which are available as technologies become more mature and as the business opportunities move closer to market. This strategy will therefore build a greater continuum of support for technologies with disruptive innovation potential that may take many years to reach the market.

Our thinking and our activities will be guided by the view that **people don't buy technologies; people buy what technologies do for them**. Our experience of the process of commercialising technology is that it is long and difficult. It takes energy and commitment. It takes longer than you think it will. It often impacts where you didn't expect it to, so unless you are flexible you are unlikely to survive. And unless you can explain clearly what you are doing you are unlikely to attract investment and your business will die.

The four elements in our strategy are to:

- invest in technology demonstration
- build critical mass
- create a coordinated programme
- build and nurture capability.

Invest in technology demonstration

One of the rate-determining steps in commercialising technology is the transition between the different phases of emergence.

We will: invest in demonstrators to speed up the transition between the different phases of technology emergence, to accelerate commercialisation, and to increase the likelihood of creating major new industries. We will focus on three main types of demonstrator known to catalyse the transitions from applied science to the technology-dominated phase, and from technology to the application-dominated phase:

- technology demonstrators
- application demonstrators
- commercial application demonstrators.

We will: work closely with agencies that support related activities, such as the Research Councils Follow-on Fund and regional schemes, to ensure that we provide the best overall framework for technology demonstration.

We will: support early market and business involvement to ensure that the outputs have the greatest chance of attracting investment and moving forward to commercialisation.

Build critical mass

We will: take steps to bridge the gap between the various types of technology demonstrator and the market. Innovation and knowledge centres (IKCs) are a good vehicle for driving technology and matching innovations with customers in high potential, broad areas of technology.

We plan, in partnership with the Engineering and Physical Sciences Research Council, the Biotechnology and Biological Sciences Research Council and other research councils, to increase the number of IKCs and align them more closely with emerging technology areas of major strategic importance for the UK.

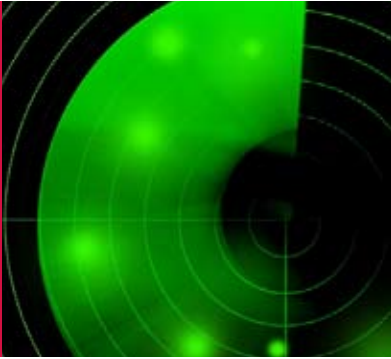
These IKCs will form the basis of innovation 'ecosystems', bringing together people with the right technical, business and commercialisation skills in a flexible, highly entrepreneurial environment. They will create strong connections with potential customers, existing industry and investors, and will develop compelling market-led strategies for commercial exploitation.

We will: identify, with the Ministry of Defence, Department of Health and other government departments, key areas of future procurement that are aligned with emerging technologies, and these will be targeted within the Small Business Research Initiative (SBRI) scheme.

In this way we will support small new companies, which play a special role during the early stages of commercialising disruptive innovations.

We will: work closely with the investment community to encourage greater early-stage investment in companies driving disruptive innovations.

The best way we can contribute to tackling the equity gap is through making such investments more attractive, not through setting up a new source of capital. Our approach will therefore be to help lower the risk and increase deal flow by supporting high-quality demonstrator and IKC



programmes. While it is important to increase the availability of equity funding, other organisations are better placed in terms of expertise to do this. We will consult the investment community to ensure that the outputs of these programmes are aligned with their expectations in terms of the degree of confidence and understanding of the business proposition required at this stage.

Create a coordinated programme

We will: build a coordinated Emerging Technology Programme bringing together different elements of UK activity to establish a competitive position and create significant value for the UK in new high-growth markets and industries based on emerging technologies.

The programme will bring together public and private sector expertise to coordinate the actions of the various agencies involved and progressively focus support on areas of greatest national significance. The programme will stretch from the science base to wealth generation by business.

We will: establish an Emerging Technologies and Industries Steering Group to build consensus across agencies on decision-making and allocating resources.

The steering group will coordinate work to agree, prioritise and oversee a national portfolio from which future nascent industries will arise.

Build and nurture capability

Our aim is to make the UK a leading practitioner of commercialising emerging technologies, and to build its strength as a centre of excellence in this sphere. We believe that not only will this help us build entirely new UK-based industries and strengthen existing ones, but it will also help attract overseas investment.

It is not enough to have the most exciting technology ever invented. It is people, and the right sort of people, who turn great ideas into commercial successes. A set of diverse skills is required, from market analysis to technology development, and from intellectual property management to business modelling.

We will: define the types of skills that are critical for success at different stages, and will identify important gaps and ways to improve capability in the UK.

We will: monitor and study the impact of our interventions on the development of future industries from emerging technologies.

Further information

This is a summary of the Technology Strategy Board's *Emerging Technologies and Industries Strategy*. For the full document, see www.innovateuk.org

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.

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