

Technology Strategy Board

Driving Innovation

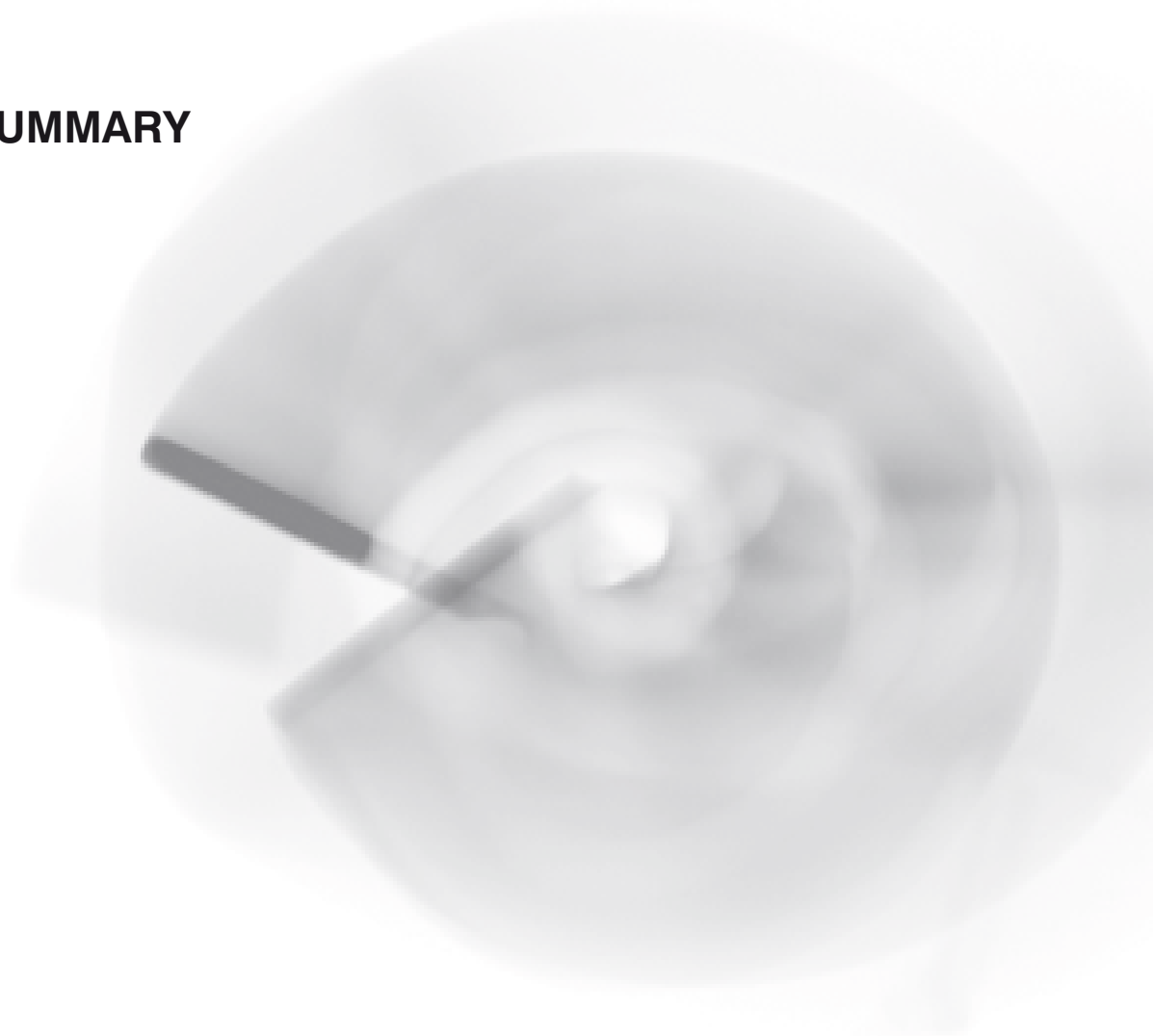


Advanced Materials

Key Technology Area

2008-2011

EXECUTIVE SUMMARY



Executive summary

This is a summary of the Technology Strategy Board's Advanced Materials Key Technology Strategy. For the full document see www.innovateuk.org

Businesses in the UK that produce, process, fabricate and recycle materials have an annual turnover of around £170 billion. They contribute about 15% of UK GDP, with a gross value-added (GVA) of around £60 billion, and form an important element in the supply chain of many high value manufacturing businesses. This strategy outlines ways in which the materials sector can continue to innovate and grow, further enhancing its contribution to solving key societal problems and enhancing national wealth creation.

The strategy presents a holistic approach for innovative advanced materials development and application, which aims to provide continuity and commitment in key areas and to support the UK as a provider of high value-added products, processes and services. It aligns with the higher level strategy and investment criteria of the Technology Strategy Board

and complements other individual Technology Strategy Board Key Technology and Application Area strategies.

Its scope encompasses materials, and their associated process technologies, with the potential to be exploited in high value-added products. These are considered within four broad major categories: structural, functional, multifunctional and bio-materials, together with important cross-cutting areas; including nanomaterials, modelling, design, metrology and standards, process technologies and manufacturing.

Three priority areas, based on an analysis of common market sector drivers, are identified as channels for technology-inspired activities leading to high added-value products and processes with exploitation potential via multiple strong UK market sectors, (Figure 1).

■ **Energy**

- secure, clean and affordable energy supply, distribution and usage

■ **Sustainability**

- focused on transport, construction and the 'reduce, reuse and recycle' agenda, including packaging

■ **High Value Markets**

- including technologies for Healthcare, the Creative Industries, and Defence and Security.

The need is recognised for continued investment in underpinning and emerging generic materials technology development, and exciting thrust areas are identified which are anticipated to have a major impact in the key challenge areas. These are listed in Figure 2, together with a broad mapping of their likely major impact potential. The UK has recognised capability strengths within each of these areas, in both the Science and Technology (S&T) base and industry.

Figure 1 – A technology-inspired strategy focused through key challenge areas

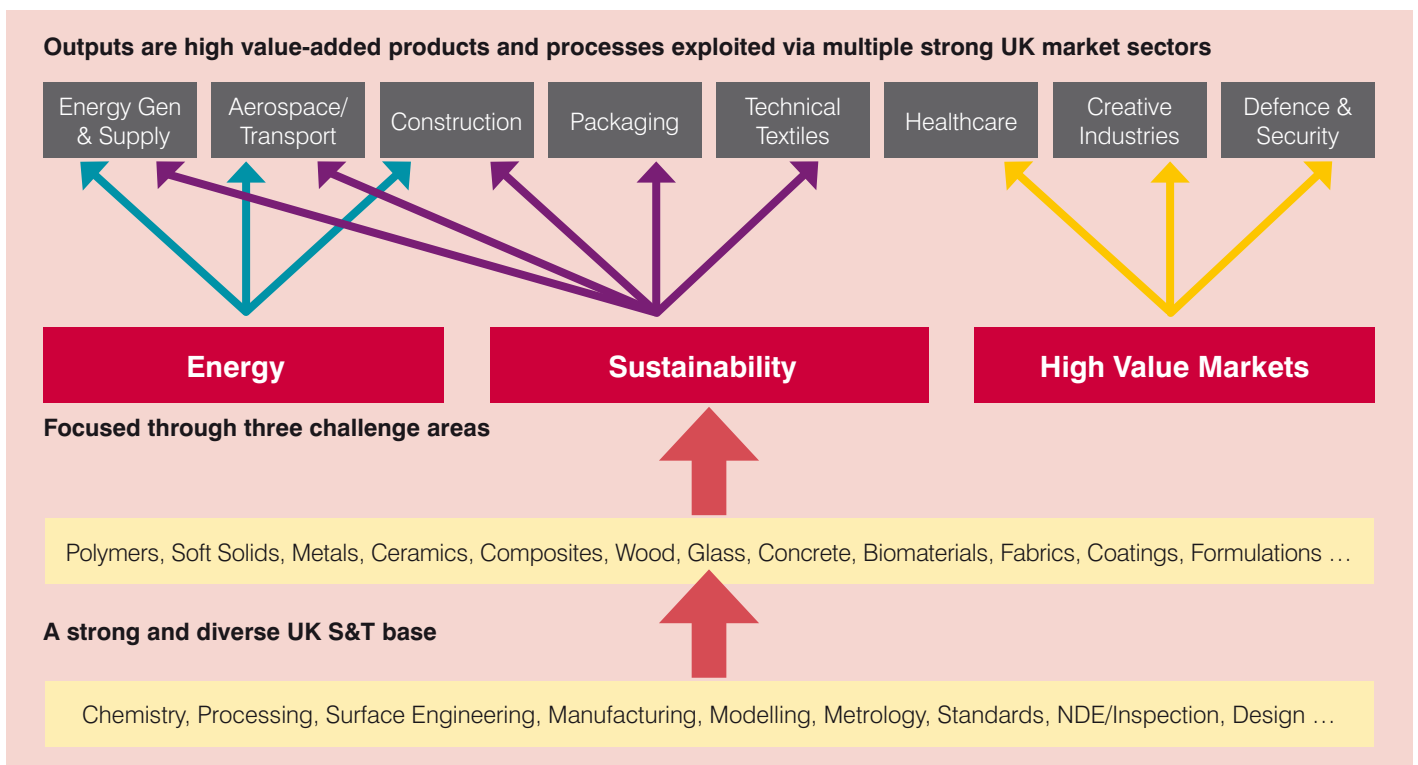



Figure 2 – Technology thrusts in each of the key challenge areas

	Energy	Sustainability	High Value Markets
Lightweight materials and structures, including composites and hybrids	x	x	x
Materials to withstand more aggressive environments (e.g. high temperature, corrosive, erosive)	x	x	x
Electronic and optical functional materials	x		x
Smart and multifunctional materials, devices and structures	x	x	x
Surface engineering and coating technologies	x	x	x
Particulate engineering; near-net shape manufacturing	x	x	
Fibre and textile-based technologies	x		x
Bioresorbable, bioactive and biocompatible materials			x
Natural and bio-based materials		x	x
Joining technologies	x	x	x
Materials for portable power sources (batteries/fuel cells)	x		x
Nanomaterials	x	x	x
Materials with reduced environmental impact through life		x	
Materials designed for reuse/recycle/remanufacture		x	
NDE/SHM/condition monitoring	x	x	x
Predictive modelling through the full life cycle, including lifetime prediction	x	x	x

Strong stakeholder co-ordination and multidisciplinary collaboration is proposed, in order to facilitate the effective delivery of the strategy.

In the period 2008-2011, the Technology Strategy Board will:

- invest in materials technologies which address the key challenges of energy and the environment;
- invest in materials technologies focused on the 'reduce, reuse and recycle' sustainability agenda;
- continue to invest in materials for high value markets, including healthcare, the creative industries and defence and security;
- work with other government and industry stakeholders to identify opportunities for joint or aligned activities; including generic underpinning R&D and proof-of-concept studies;
- work with other stakeholders in respect of metrology and standards development;
- support an innovation culture via, for example, the use of Knowledge Transfer Partnerships (KTP) and Knowledge Transfer Networks (KTN); and
- seek, with other stakeholders, to identify European and other international strategic alignment and financial gearing opportunities in support of improved UK competitiveness and inward investment.



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