

Technology Strategy Board

Driving Innovation



Energy Generation and Supply

Key Application Area

2008-2011

EXECUTIVE SUMMARY

Executive Summary

Climate change and security of supply challenges have placed energy high on both national and international agendas, making it the subject of regular policy and legislative review within Government. The Stern Review on the Economics of Climate Change not only addressed the need for an urgent response to climate change, it also illustrated in detail the importance of Government policy in driving innovation in low carbon energy technologies. The 2007 Energy White Paper has defined the short, medium and long term challenges both on a national and global scale. UK Government and EU have developed and are still developing a range of policies and incentives to tackle these challenges, such as the UK renewables obligation, the renewable transport fuel obligation, the code for sustainable homes, and the EU renewable directives.

The policy drivers around the energy challenges are creating market opportunities to deliver innovative solutions where the UK is well placed to take advantage. A significant number of UK

businesses are world leading and have a presence along the entire energy supply chain, from exploration, resource extraction and processing, to power generation (with fossil, renewable and nuclear fuel), transmission, distribution and energy service provision. In addition, supporting industries such as materials, electronics, and engineering services in the UK will benefit. To complement this business capacity, the UK has substantial academic expertise, providing the essential scientific platform for innovation.

Our role and scope

The Technology Strategy Board aims to stimulate innovation throughout the energy supply chain, through a number of its investment mechanisms:

- Key Application Areas –
 - Energy generation and supply
 - Transport
 - Environmental sustainability.
- Innovation Platforms in low impact buildings and low carbon vehicles, addressing respectively energy use in buildings and in transport.

- Key Technology Areas that address technologies that underpin the energy sector, such as advanced materials, high value manufacturing and electronics, photonics and electrical systems.

The Key Application Area of Energy Generation and Supply covers oil and gas extraction, energy generation through fossil and low carbon sources, and distributed and centralised energy supply. Our aim is to promote wealth creation in the UK through investment in innovation in energy generation and supply which will also:

- Provide enhanced security of supply through maximising the recovery of UK natural fuel resources and the development of a portfolio of low-carbon energy technologies.
- Reduce environmental impact of energy technologies through the development of low carbon technologies.

The UK will need to address its energy challenges by the deployment of a portfolio of technologies, as there is no single one that will enable the achievement of UK energy policy targets. Each technology will have different needs; some are unproven at a commercial scale and involve large scale investments and infrastructures, whilst others, although proven, are not yet cost competitive with traditional technologies and/or lack a well established supply chain. These technologies potentially have substantial opportunities in markets such as electricity and heat generation and supply, transport, portable power and power plant manufacturing, with policies and regulations being key drivers for the uptake of these technologies.

The Technology Strategy Board in the UK energy innovation chain

The magnitude of the challenge, the broad portfolio of technologies needed and the requirements for innovative solutions in energy, are such that no single organisation can realistically take responsibility for all the elements of the innovation chain, hence co-ordination and co-operation are crucial to the effectiveness of the system.

The Technology Strategy Board works closely with key players in the UK energy innovation chain, such as ETI, Carbon Trust, ETF, BERR, the research councils, regional development agencies and devolved administrations. Continuous dialogue allows the players to develop complementary programme of activities, and avoid both duplication and technology gaps.

The low carbon innovation coordination group

The Carbon Trust, ETI and Technology Strategy Board Chief Executive meet regularly to identify and exploit opportunities for synergy, avoid duplication of activities and to incorporate an awareness of each others' plans into decision-making, in order to achieve a coherent position and communicate it externally.



Pelamis wave power system in manufacture

Within the Energy Generation and Supply Key Application Area, we have considered technologies with substantial R&D challenges, their potential to make an impact for the UK and their prioritisation and level of public funding through other agencies. Many of these are technologies which have also been identified in the Energy White Paper as potential contributors to the achievement of the UK policy goals, they include: offshore wind, marine, bioenergy, carbon abatement technologies for fossil power plants, hydrogen and fuel cells, microgeneration, intelligent grid, nuclear and technologies for the maximisation of oil and gas indigenous resources.

Our priorities

Taking into account the current energy innovation landscape, we have prioritised areas against the Technology Strategy Board strategic criteria, and identified the need for investment in technologies for energy generation and supply and investment in knowledge flow during the period 2008-2011. Working closely with ETI, BERR, RDAs, DAs and research councils we will:

- Directly invest in R&D for carbon abatement technologies for fossil power plants, fuel cells, hydrogen and technologies for the maximisation of oil and gas indigenous resources.
- Invest through, or jointly with, other organisations in offshore wind and marine, ensuring appropriate engagement of UK business.
- Work in collaboration with other key application areas, key technology areas and Innovation Platforms to identify, invest and deliver additionality into the energy generation and supply innovation chain (for example in biofuels, microgeneration and through underpinning technologies).

- Carry out further analysis in areas where the added value of Technology Strategy Board investment is currently unclear (bioenergy, intelligent grid management and nuclear).
- Encourage flow of people and ideas to stimulate more innovative approaches to energy technologies by:
 - Leveraging on centres of expertise in energy technologies supported by the research councils in order to provide businesses with access to the expertise.
 - Invest in projects undertaken by academics to solve specific business problems, encouraging Knowledge Transfer Partnerships in the defined priority areas.
- Explore possibilities of international and business to business or business to science Knowledge Transfer Partnerships, to stimulate flow of knowledge and people between UK leading players and international leaders in the defined priority areas.
- Building on existing structures, we will focus on the support of enhanced co-ordination of knowledge transfer activities specifically to achieve the Technology Strategy Board objectives of driving knowledge exchange in the business communities and informing government of key technology needs to help shape our future programme.

The Technology Strategy Board has a distinctive role in the UK energy innovation chain:

- Focuses on wealth creation for UK business through technology innovation.
- Has an established reputation with business.
- Delivers innovative technology and encourages increased private sector R&D investments, through complementary and flexible mechanisms which are inclusive of micro-companies, SMEs, universities and large businesses. Current mechanisms include:
 - Collaborative Research and Development (by Key Application or Key Technology Areas (KAA and KTA))
 - Innovation Platforms
 - Knowledge Transfer Networks
 - Knowledge Transfer Partnerships.
- Has a clear commitment from research councils and regional development agencies to align a proportion of their resources with the national technology strategy.
- Works with the relevant government departments and other funding agencies to drive innovation and enable UK companies to exploit the opportunities by helping define the market opportunity and invests in innovation within it.
- Provides 40% of public sector funding (up to £20M pa) to the Energy Technologies Institute, of which it is also a board member.

Technology Strategy Board funding in this area primarily targets business-led innovation from applied R&D to early stage, pre-commercial demonstration.

This is a summary of the Technology Strategy Board's Energy Generation and Supply Key Application Area strategy. For the full document see www.innovateuk.org

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