

**Technology Strategy Board**

Driving Innovation



# Low Impact Buildings

Innovation Platform



# Low Impact Buildings Innovation Platform

**The Low Impact Buildings Innovation Platform aims to help the UK construction industry deliver buildings with a much lower environmental impact.**

**The UK construction market is worth over £100bn per year, and there is growing pressure from customers and regulators for more environmentally friendly buildings, creating new growth opportunities for innovative businesses.**

**The Technology Strategy Board launched the Low Impact Buildings Innovation Platform in May 2008. We will commit funding for new projects initially until about 2012, with activity on those projects continuing beyond that. We invest jointly with industry and other funders in projects to bring innovative solutions to this growing market, and to overcome barriers to the wider use of existing solutions.**

**The Innovation Platform budget has been increased from £30m to £47m over the initial three years to address the challenge of both new and existing buildings.**

## What is an innovation platform?

Global society faces many challenges. Through the application of technology and innovation we can help to meet these challenges and at the same time open up new opportunities for business. Innovation platforms focus on specific societal challenges where the UK Government is taking action through policy, regulation, procurement or fiscal measures to tackle the problem. They bring together key players from industry, academia and government to identify barriers to meeting the challenge, map possible routes to overcoming the barriers, and align activities

to support innovative solutions. Innovation platforms aim to deliver a step change in the ability of UK businesses to provide solutions for the global marketplace, boost UK economic performance, and provide higher-quality public services.

## Why low impact buildings?

The UK Government has set a number of challenging targets for improving sustainability, starting with the overarching goal of an 80% reduction in carbon dioxide emissions in the UK by 2050.

Some of the largest environmental impacts in the UK come from buildings. These include:

- 45% of total UK carbon emissions (27% domestic, 18% non-domestic)
- 73% of current domestic emissions arise from heating space and water
- domestic use accounts for 58% of the public water supply; all other uses account for 24%, with 18% being lost in the system
- 32% of all landfill waste comes from the construction and demolition of buildings
- 13% of products delivered to construction sites are sent direct to landfill without being used.

The UK cannot meet its declared environmental targets without dramatically improving the life-cycle environmental cost of buildings.

In response to this societal challenge, the Department for Communities and Local Government (CLG), which is responsible for planning and building regulations, published its *Building a Greener Future* policy statement in July 2007, setting a timetable for all new homes to be zero carbon by 2016. This policy sets the future trajectory of building regulations and is supported by a range of other measures, including the Code for Sustainable Homes, CLG's Planning Policy Statement on climate change, its proposals for new eco-towns, and a time-limited exemption on stamp duty for new zero-carbon homes. In the 2008 Budget, Chancellor of

the Exchequer Alistair Darling announced an ambition for new-build non-domestic buildings to be zero carbon by 2019. Following this, the Department of Energy and Climate Change (DECC) ran a consultation on its Heat and Energy Saving Strategy, also called the 'Great British Refurb', launched in February 2009, which aims to reduce emissions and cut energy costs in UK homes.

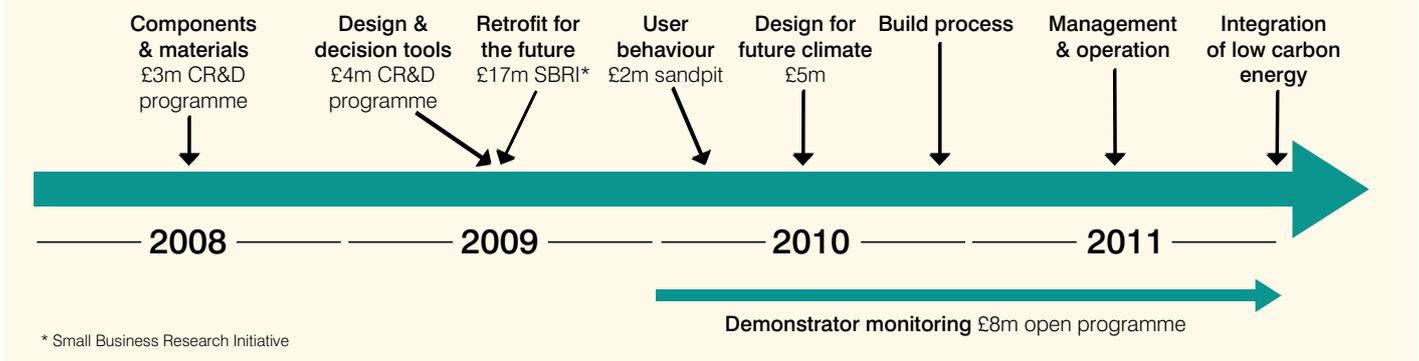
Success in meeting these demanding targets in the UK market will create opportunities in the global market, where many countries are wrestling with similar problems. In 2003 the global construction market was estimated to be worth between \$3.6 trillion and \$4.5 trillion.

## The priorities

The Technology Strategy Board identified the priority areas for the Innovation Platform following a review of published roadmaps, consultations with other organisations, and workshops. We will provide funding to support businesses to innovate in the following six areas:

- design for future climate change: designing buildings that meet the targets set by CLG, are resilient to climate change, and that users want to live and work in
- design and decision tools: developing integrated, interoperable systems that enable the holistic design of buildings
- better materials and components: filling in the gaps in what is commercially available with improved buildability, performance and cost
- build process: adapting the supply chain and build process to deliver low-impact buildings quickly, economically, at scale, and with low levels of defects
- management and operation of buildings: ensuring that low-impact buildings perform as they were designed to
- low-carbon energy sources: integrating them into low-impact buildings and the supply grid.

## Activities timeline



Three additional overarching principles for selecting areas for investment are:

- promoting systems integration methods to encourage holistic thinking
- encouraging industry to account for the interactions between buildings and their users
- realising designed-for energy savings and improved performance in practice.

## Activities overview

From 2008 to 2011 we are running a range of activities to support industry to deliver the challenges of low-impact building. These include:

- commissioning short studies to fill gaps in information
- collaborative research and development (CR&D) projects between businesses or between business and academia
- demonstrator projects to validate innovative solutions
- design competitions
- exploring new business models in the sector
- development contracts
- sandpits (five-day intensive workshops to create intriguing solutions to intractable problems).

We work closely with other organisations to design these activities to ensure that we encourage people with innovative ideas to apply for funding. Many of our discussions with other organisations are focused on finding the right challenges, clearly communicating the challenges, and devising innovative approaches that will bring out the best ideas.

In addition to large funding programmes we also support smaller activities. For example, we co-funded the UK Green Building Council report *Low Carbon Existing Homes*, and contributed to the DECC Heat and Energy Saving Strategy as a precursor to our 'Retrofit for the future' social housing demonstrator competition.

Similarly we ran a joint seminar with the Economic and Social Research Council on the behaviour of users in buildings, and produced the publication *How People Use and 'Misuse' Buildings* to scope the potential for a sandpit workshop on 'User-centred design for energy efficiency in buildings'.

## Other Technology Strategy Board funding

The Low Impact Buildings Innovation Platform is not the only source of funding for construction-related projects within the Technology Strategy Board, and all our competitions are listed on our website ([www.innovateuk.org](http://www.innovateuk.org)). We are already funding projects through competitions on energy, manufacturing, materials and sustainability, for example. Some of these projects are near to exploiting and disseminating their findings, while others are just beginning.

The projects cover topics as diverse as lighting; design tools; intelligent building management systems; water systems; façade design for energy efficiency; insulating panels for off-site manufacture; renewable generation and energy recovery; ventilation and noise management; environmental and structural health monitoring; refurbishment; and the development of many materials including polymers, UK timber, advanced glazing and insulation for use in buildings.

## Who are we working with?

Large societal challenges cannot be tackled by the Technology Strategy Board alone. We need to work with other key players to align our programmes for maximum effect. Our partners include:

### Government

- central government departments
- government bodies (e.g. Design Council)
- regional development agencies
- devolved administrations

### Industry bodies

- UK Green Building Council
- trade bodies and professional institutions
- Zero Carbon Hub
- Modern Built Environment Knowledge Transfer Network

### Other funding agencies

- Carbon Trust
- Energy Technologies Institute
- research councils
- Energy Efficient Buildings Public Private Partnership (E2B PPP)

The Modern Built Environment Knowledge Transfer Network (KTN) is a key route for engaging with our stakeholders, particularly industrial and academic. The KTN is our partner in running briefing workshops for all our competitions, and actively works to build consortia that can bid for funding to Technology Strategy Board programmes. With more than 9000 individual members, nearly 2000 organisations involved, and more than 75 events and workshops each year, the KTN gives us an excellent window on the industry. Find out more at [www.mbektn.co.uk](http://www.mbektn.co.uk)

## Projects portfolio

As a result of funding competitions, we have a growing portfolio of ongoing R&D projects run by large and small consortia. Here are some examples.

### Improved Processes and Materials for Energy Saving Glazing (PROMISE)

The PROMISE project is creating interesting results for its three partners, based near Liverpool. SAFC Hitech Ltd (lead partner), Pilkington Technology Management Ltd and the University of Liverpool are working together to develop new, improved low-emissivity glass coatings as well as more efficient, cost-effective processes to fabricate them.

Low-emissivity glass, sometimes known as 'low-E' or 'low-energy glass', is playing an increasingly significant role in energy efficiency in buildings. The key feature of this glass technology is a thin coating with a refractive index chosen to enhance the capture of solar energy and reduce heat loss from within the building. The project is working particularly well because each partner's role and expected benefits are clearly defined. This along with good project management is resulting in exciting new research findings.

### The Ceramics Paints project

This project aims to deliver innovative decorative paints that improve thermal stability in buildings, leading to a reduction in in-use energy consumption. Project partners are The Welding Institute (TWI), AkzoNobel Decorative Paints (ICI Paints), Arup, Morgan Lovell and the Thames Gateway Institute for Sustainability. The project will involve three key innovations: the development of novel aqueous coatings for use during building construction and refurbishment; the delivery of application processes to ensure ease of use; and proof of efficiency in new and refurbished buildings.

The consortium covers the complete supply chain, from innovative materials technology, novel coatings formulation and application experience to the building sector and customer base to deliver validated prototypes. The project is targeting the UK new-build market for housing and non-domestic buildings and building refurbishment, and could allow leverage into EU and global markets.

### Sustainable housing from Sitka Spruce (the Shss House)

This project, started in January 2009, is taking forward the results of previous basic research to overcome the technical barriers and economic challenges of using Sitka Spruce in an integrated whole-house system for low-carbon affordable housing. This will promote the conversion of a high-volume low-value crop into a high-value low-carbon whole-building system that is low cost, high utility and sustainable.

The partners, Coed Cymru, Pontrilas Group Packaging Ltd, Kenton Jones Ltd and Grŵp Gwalia, have displayed their as yet uncertified panellised system at trade shows and at the Smithsonian Museum. The system is light but very strong and easy to erect on the simplest foundations. It is being branded as Ty Unnos, which translates into English as 'House over Night'.



### Who are we?

The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its mission 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 the quality of life. It is sponsored by the UK's Department for Business, Innovation and Skills (BIS).

### Further information

Further information is available in the Low Impact Buildings Innovation Platform section at [www.innovateuk.org](http://www.innovateuk.org) and from [Fionnuala.Costello@tsb.gov.uk](mailto:Fionnuala.Costello@tsb.gov.uk), [Neil.Morgan@tsb.gov.uk](mailto:Neil.Morgan@tsb.gov.uk), [Ian.Meikle@tsb.gov.uk](mailto:Ian.Meikle@tsb.gov.uk) and [Richard.Miller@tsb.gov.uk](mailto:Richard.Miller@tsb.gov.uk)

The Technology Strategy Board  
North Star House  
North Star Avenue  
Swindon  
SN2 1UE

Telephone: 01793 442700

[www.innovateuk.org](http://www.innovateuk.org)