

Technology Strategy Board

Driving Innovation



Building Performance Evaluation

**COMPETITION FOR FUNDING
MAY 2010 – 2012**

Building Performance Evaluation

COMPETITION FOR FUNDING

Summary

The Technology Strategy Board has committed up to £8m to fund the costs of building performance evaluation studies on domestic and non-domestic buildings.

We will be funding individual companies and other organisations responsible for buildings for the total cost of evaluating the performance of case study buildings they design, build, own and/or operate.

We will be funding two types of study for **domestic** buildings – Phase 1 and Phase 2, covering ‘post-construction and early occupation’ and ‘in-use’ respectively. Similarly, there will be two categories of study for **non-domestic** buildings, one for buildings under construction, and one for those in use and no more than three years old.

Applicants will benefit directly through the involvement of expert building performance evaluators, who will help them to determine how their buildings perform and why. Longer term, generic learning from across the studies will help the sector as a whole deliver more efficient, better performing buildings.

Funding will be allocated in tranches at quarterly intervals over two years, with the final closing date for applications being 11th January and 12th April 2012 for non-domestic and domestic projects respectively.

Background and challenge

The UK Government has set challenging targets for improving sustainability and limiting anthropogenic climate change, starting with the goal of achieving an 80% reduction in carbon dioxide emissions in the UK by 2050, with an intermediate goal of 26% by 2020 compared to 1990 levels.

About 45% of the UK’s CO₂ emissions come from buildings, and the Technology Strategy Board’s Low Impact Building Innovation Platform is running a number of competitions for funding to stimulate

innovation towards achieving these goals while simultaneously improving the competitiveness of UK companies.

A key challenge is to ensure that building designs lead to physical buildings that perform as intended.

There is typically a significant discrepancy between the predicted energy performance of a building (and hence its CO₂ emissions) and the measured performance. The base energy requirement of a building is up to twice that predicted, neglecting energy used as a result of the activities undertaken in the building, and when these additional uses are taken into account the energy required can easily be as great as four times that predicted.

These discrepancies arise from a variety of sources, ranging from the design and modelling tools used in the design of the building, through buildability, build process and build quality, systems integration and commissioning, handover and operation, to the understanding, comfort and motivation of occupants.

In 2009 the Low Impact Building Innovation Platform awarded funding to deliver improved design and decision tools as a significant step in equipping design teams with the means to deliver low impact building designs. This Building Performance Evaluation competition is a further important piece of the jigsaw, enabling the industry as a whole, and especially those responsible for the selected case study buildings, to understand the performance of different building types, design strategies, construction methods and occupancy patterns, and the relative contribution of various factors to the eventual performance of the building.

While this information will be of direct short-term value to successful applicants, longer term benefits will accrue to the whole sector through the collation, analysis and dissemination of performance data and associated case study reports produced through the Building Performance Evaluation programme.

Scope

This competition comprises two separate streams, one for **domestic** and one for **non-domestic** buildings, recognising their differences in procurement, delivery, tenure, operational characteristics and current practices for predicting and evaluating building energy performance. Domestic projects must be new build and non-domestic projects can be new build or, under certain circumstances, major refurbishment. For domestic buildings, Phase 1 studies will cover ‘post construction performance and initial occupation’, and Phase 2 studies ‘in-use performance and post occupancy evaluation’. For non-domestic buildings, studies will be categorized as ‘buildings under construction and nearing completion’ or ‘in use’.

Project eligibility for each tranche will depend on the practical completion date for the building or development, as indicated in the tables at the end of this document.

Domestic buildings

Three-fifths of the UK’s building-related CO₂ emissions come from domestic buildings. There is currently a national requirement that all new homes built from 2016 onwards are to be zero carbon.

We would like to see applicants from organisations of all sizes, for studies ranging in scale from individual units to multi-unit developments. Applications may focus on a single dwelling or dwelling type, be comparative studies between substantially identical dwellings where the impact of specific attributes or variables is of interest, or where the applicant is anticipating making changes to the design or delivery of future units based on the findings of initial studies.

Phase 1 studies will typically be carried out within a 3-6 month window, spanning practical completion and early occupation. Phase 2 studies will typically follow



Phase 1 projects, although some may ‘stand-alone’ or precede construction of subsequent phases of a development. Phase 2 studies will last approximately two years to enable energy monitoring over two heating seasons.

For applications to be ‘in scope’ the applicant must confirm they can provide information appropriate to the stage of completion at the time of application, on the design and construction of the dwelling(s) to demonstrate the design intent and the way in which this has been or is being implemented. For Phase 2 studies, applicants must be able to collect information on energy performance and occupant feedback as required by the study and in accordance with the specified protocols and techniques.

Non-domestic buildings

Two-fifths of the UK’s building-related CO₂ emissions come from non-domestic buildings, and the UK Government has declared its ambition for all new non-domestic buildings to be carbon neutral by 2019.

Non-domestic buildings are typically larger than individual dwellings, have more complex facilities management and are host to a wide variety of activities and occupancy patterns. They also come into being through procurement processes involving numerous design and construction specialists.

We aim to fund the evaluation of non-domestic buildings which provide good potential to determine how buildings perform in relation to their predicted performance and why.

Suitable case study buildings may serve a particular sector – such as commercial, retail, leisure or healthcare – and contribute to learning about the particular characteristics of building performance in that sector. Alternatively, they may typify specific procurement routes or design

strategies. Applicants may include, for example, designers, construction companies, developers, property managers and/or occupants, and they should have some responsibility for the performance of the building they wish to study.

The competition is also open to companies undertaking major refurbishment of older non-domestic buildings where a core objective is to improve the energy performance of the building significantly.

Suitable case study buildings will be either nearing completion (within nine months) or newly occupied (no more than three years post completion), as detailed in the tables overleaf.

Applicants will need to have both the authority and the ability to provide original design information, performance predictions, and information on the construction process, hand-over and operation, as well as the authority to collect additional data during the course of the case study.

Study details

Building performance evaluators will help applicants determine how their buildings perform. The Technology Strategy Board is working with professional organisations to compile a register of providers of evaluation skills and services which applicants can use to find providers of specialist services.

To provide maximum benefit to applicants and to the sector as a whole, a range of standard procedures, protocols and techniques has been identified for use by applicants and their building performance evaluators. These cover the evaluation of a wide range of factors including:

- fabric performance
- energy performance
- services design, installation and performance
- occupant perception and satisfaction.

All studies will conclude with a full feedback and debriefing workshop, involving the building performance evaluator, to maximise learning for applicants and their direct stakeholders.

Application process

This competition will run over two years with tranches at approximately three – monthly intervals. Deadline dates for domestic applications and non-domestic Initial Proposals are shown at the end of this document and any revisions will be posted on www.innovateuk.org under Competitions.

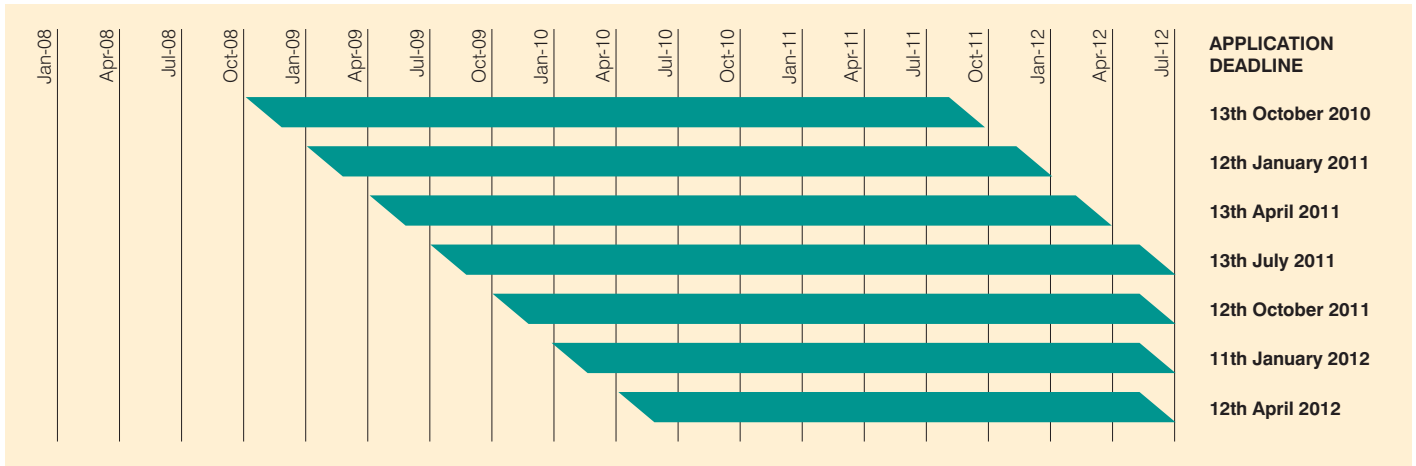
For **domestic** projects the competition follows a single stage process – applicants are required to submit an application using a standard form downloaded from our website. Applicants should also read the relevant Guidance for Applicants and Guide to Project Execution.

For **non-domestic** projects the competition process is two-stage – applicants should submit an Initial Proposal using the standard form downloaded from our website. Applicants should also read the relevant Guidance for Applicants before applying. The application form and supporting documentation are available on our website at www.innovateuk.org under Competitions.

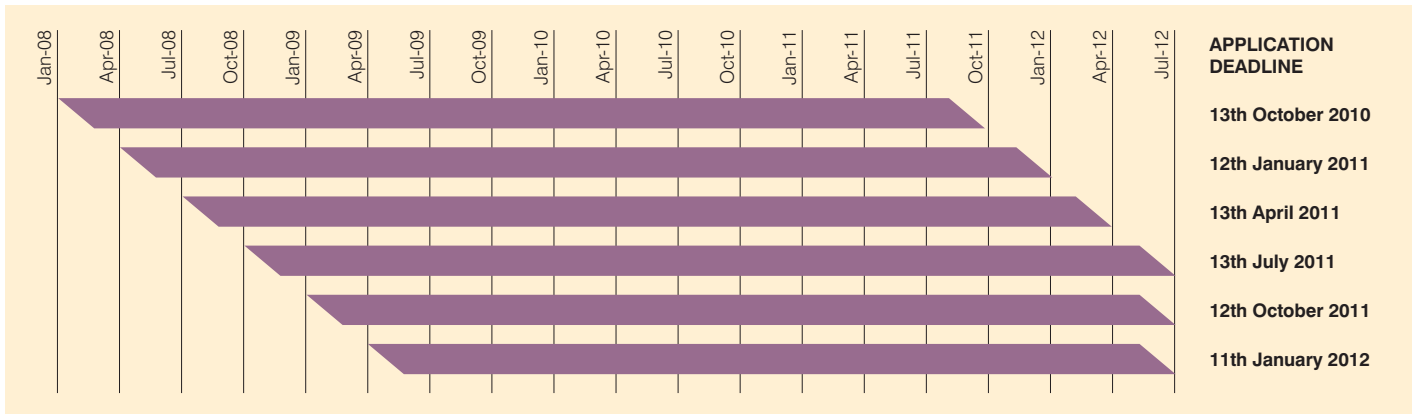
Applicants for non-domestic studies who are successful at the Initial Proposal stage will then need to provide further information about the building to be studied, using a prescribed spreadsheet. This will be used by a building performance evaluator assigned by the Technology Strategy Board to undertake an initial study which will provide the applicant with useful early evaluation feedback and inform the proposal for the full project. The applicant will then progress to a full-stage application.

Eligibility criteria according to application deadlines

Domestic building completion date



Non-domestic building completion date



NB: Applications **must** fulfil the relevant construction practical completion 'window' to be eligible for consideration. If in any doubt please contact the helpline **before** making an application.

Further information

Access to competition information will be available throughout the two-year open period, through information events, surgeries, webinars and downloadable documentation. These will be publicised on the Technology Strategy Board website, www.innovateuk.org.

Ad hoc support is also available from the Modern Built Environment KTN at www.mbektn.co.uk.

Competitions helpline:
 0300 321 4357

Email:
competitions@tsb.gov.uk

Publicity

The Technology Strategy Board frequently publicises the results of competitions and this includes engagement with the media. All applicants will be given a chance during the competition process to opt out of any publicity. Willing 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.

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

Telephone: 01793 442700

www.innovateuk.org